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The Macintosh® Magazine

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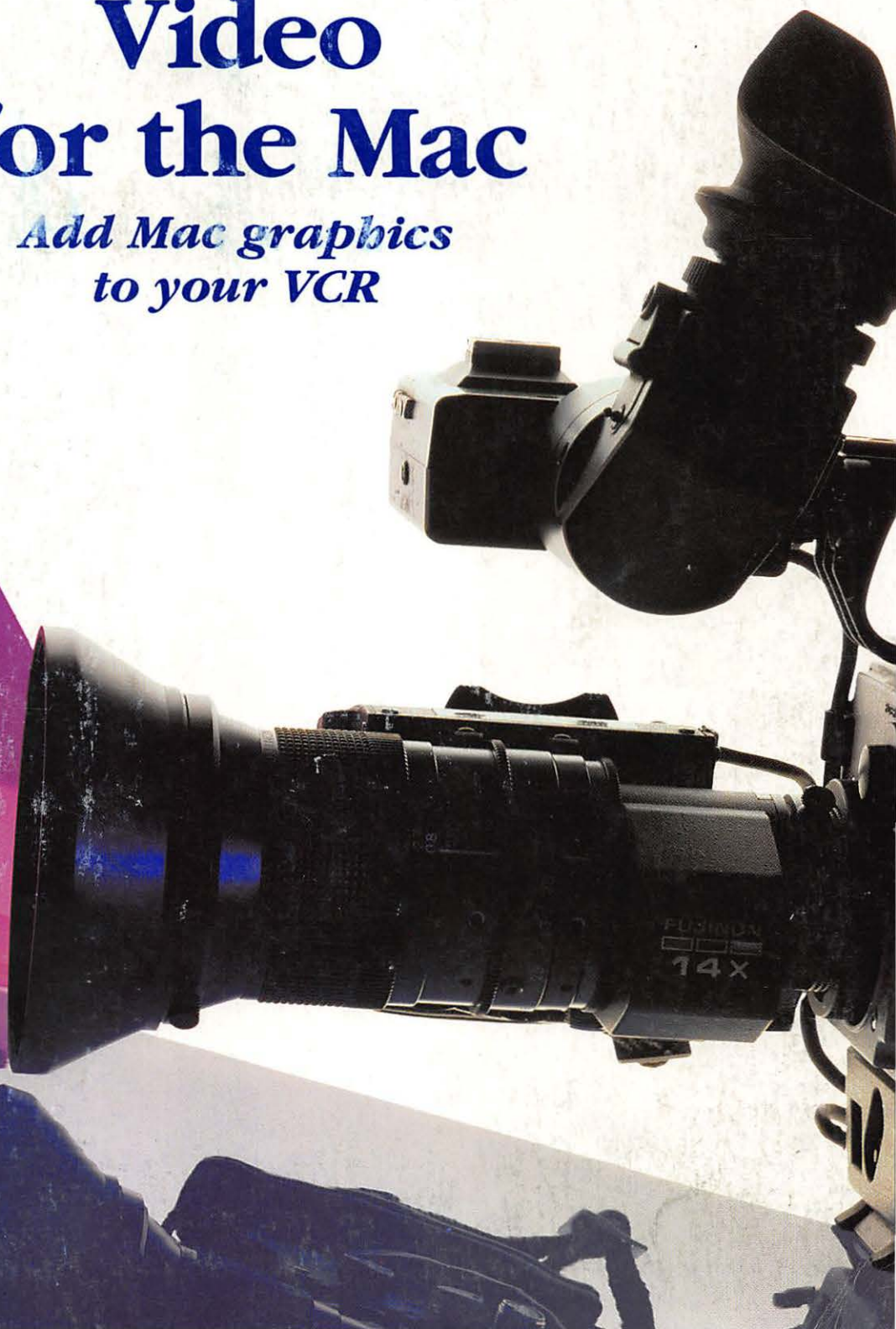
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Eight Low-Cost
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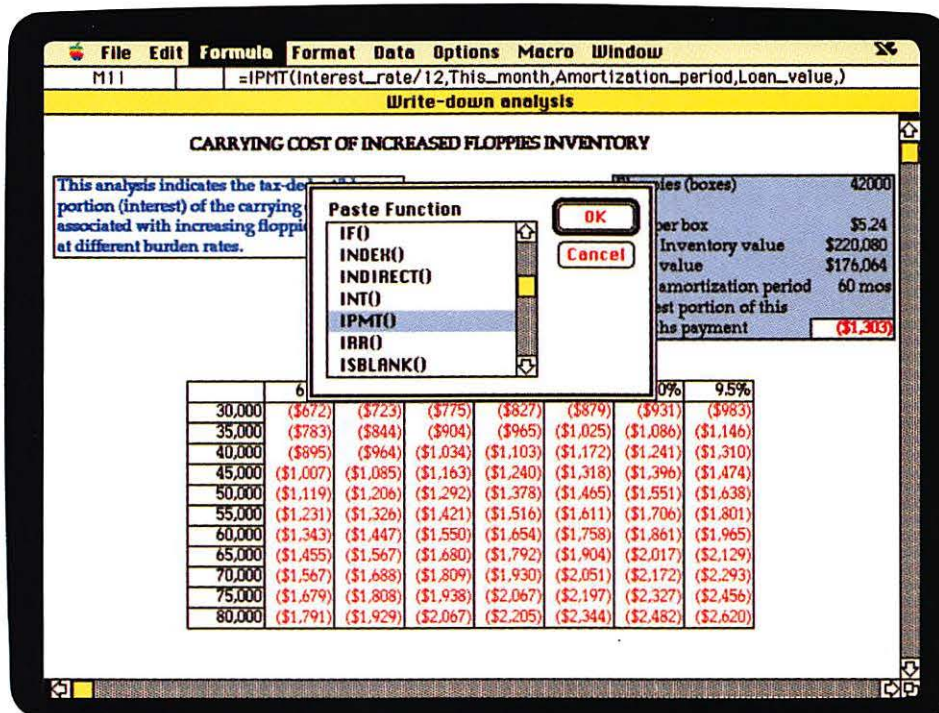
22 Accounting
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Readers' Choice:
The Best Mac
Products

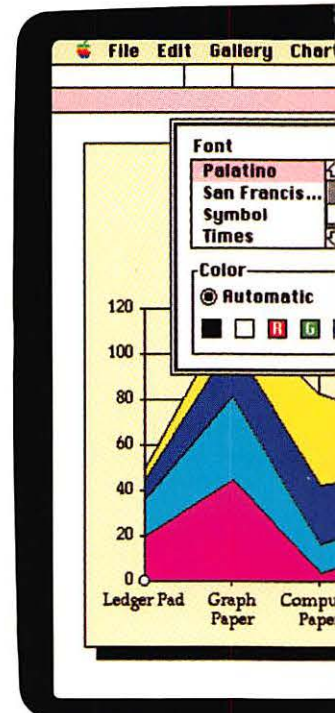
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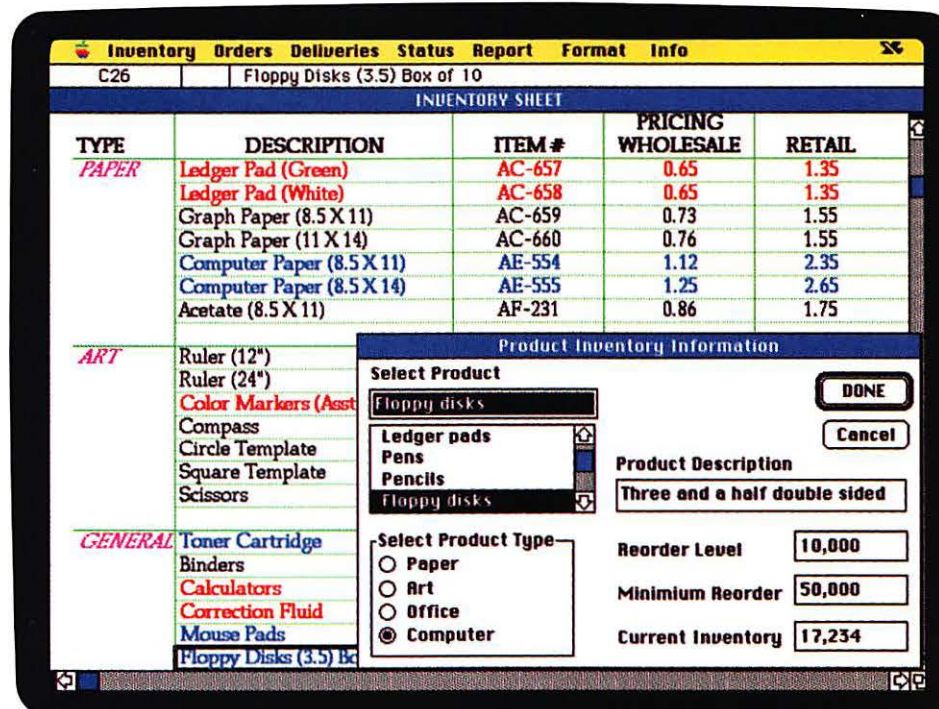
Sooner or later someone was b



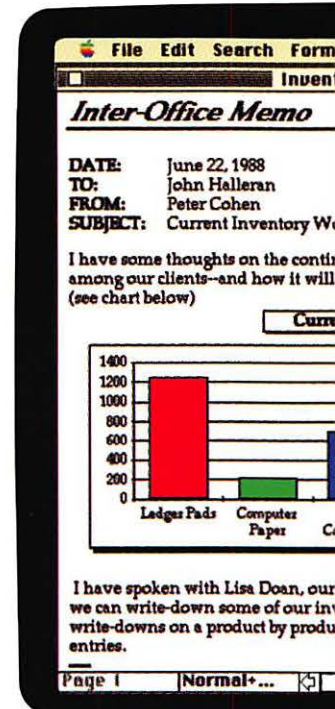
With our 44 new worksheet functions, you'll be able to build more powerful formulas that can be used to develop a broad range of analysis. They run the gamut from matrix math to depreciation functions.



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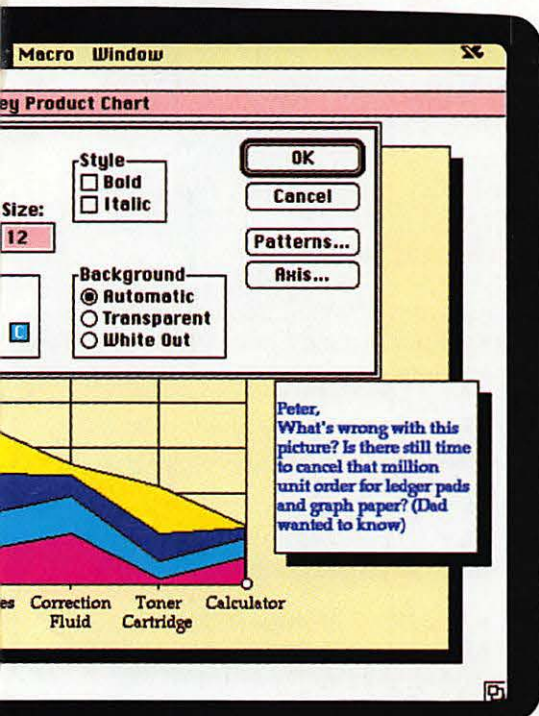
Microsoft Excel can be customized to meet your particular business needs. You can even customize menus and dialog boxes to prompt users unfamiliar with the program.



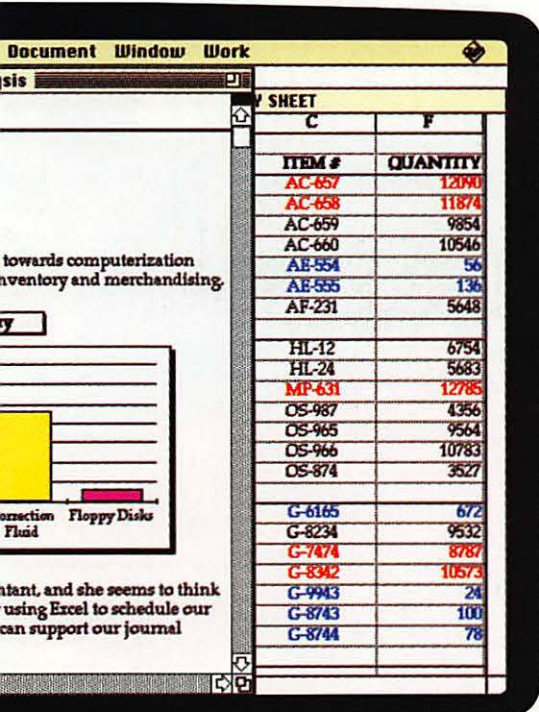
I have spoken with Lisa Doan, our we can write-down some of our inv write-downs on a product by produ entries.

If you have a multitude of things Finder, it will continue calculati plications such as Microsoft Wor

bound to exceed Microsoft Excel.



your choice of color, patterns, size or type just by clicking on the button.



Microsoft Excel 1.5 is the program for you. Under MultiFinder, even when you move on to other applications, Microsoft Excel 1.5 is still running in the background.

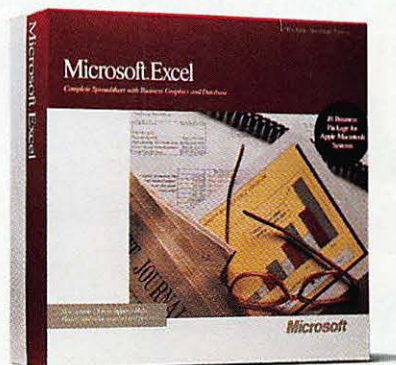
It's been said that outdoing the competition is relatively easy. Outdoing yourself is the hard part.

We couldn't agree more.

Case in point: Microsoft® Excel. We took the most powerful, most popular spreadsheet program in today's Macintosh® market and made it history. Enter Microsoft Excel version 1.5.

It lets you customize your own menus and dialog boxes. Which is perfect for an environment with one-of-a-kind needs. Namely, your office.

And since customization is now easier for the independent software developer, you'll be seeing a lot more applications that use Microsoft Excel to give you specific solutions for your specific needs.



Introducing Microsoft Excel version 1.5.

Microsoft Excel 1.5 also gives you full color support for the Mac® II. Which makes your daily spreadsheets look more like annual reports.

We've even built Microsoft Excel 1.5 to take advantage of MultiFinder™, the program that lets your Mac do more than one thing at a time. In other words, you can have Microsoft Excel number crunching in the background while you're word processing in the foreground.

And if Microsoft Excel wasn't simple and powerful enough, we've added simpler tools for developing charts and 44 powerful new worksheet functions. All of which means that you do less work.

Of course, we're going to need a lot more room and you're going to need a lot more time to go over everything Microsoft Excel 1.5 has to offer. So we suggest you call (800) 541-1261, Dept. 140 for a copy of the Microsoft Excel 1.5 brochure and the name of your nearest Microsoft dealer.

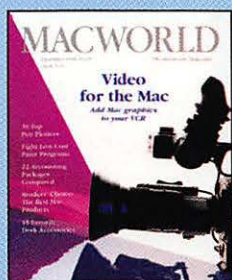
Over eighty-percent of all spreadsheets in use on the Macintosh are Microsoft Excel. And with all the enhancements of Microsoft Excel 1.5, we're bound to exceed that.

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MACWORLD

September 1988

The Macintosh® Magazine



On the Cover

Stay tuned as the Mac enters videoland (page 142) and see how video publishing is bridging the gap between the TV studio and the Macintosh desktop. (Photo by Fred Stimson.)

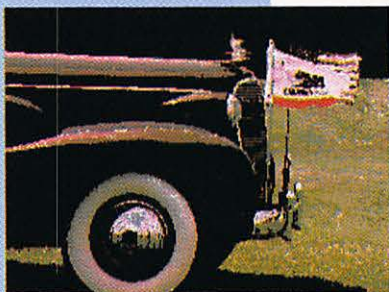
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- **Math Power on the Mac** A potent calculation tool for scientists and engineers.
- **Virus Remedies** Protecting your Mac from deadly infections.
- **New Era in Storage** ROEM—removable, optical, erasable media for storage gluttons.

Plus, Pixar sets a 3-D graphics standard, paint your own color business cards, Novell's new Mac network, and more.



Tune up your artwork with LaserPaint Color II (page 228).

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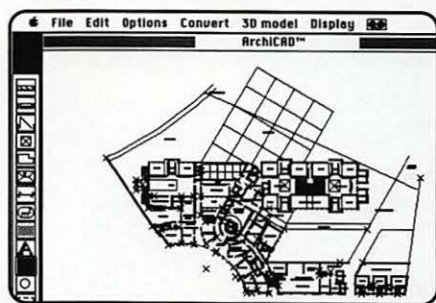
252 **Window Shopping**

A column chock-full of quality programs and peripherals.



GraphistPaint II, a new color graphics program from Aba Software, is just one of many exciting products to be found at the latest Macworld Expo in Boston (page 55).

ARCHITECTURE



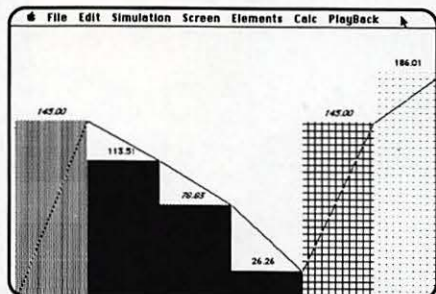
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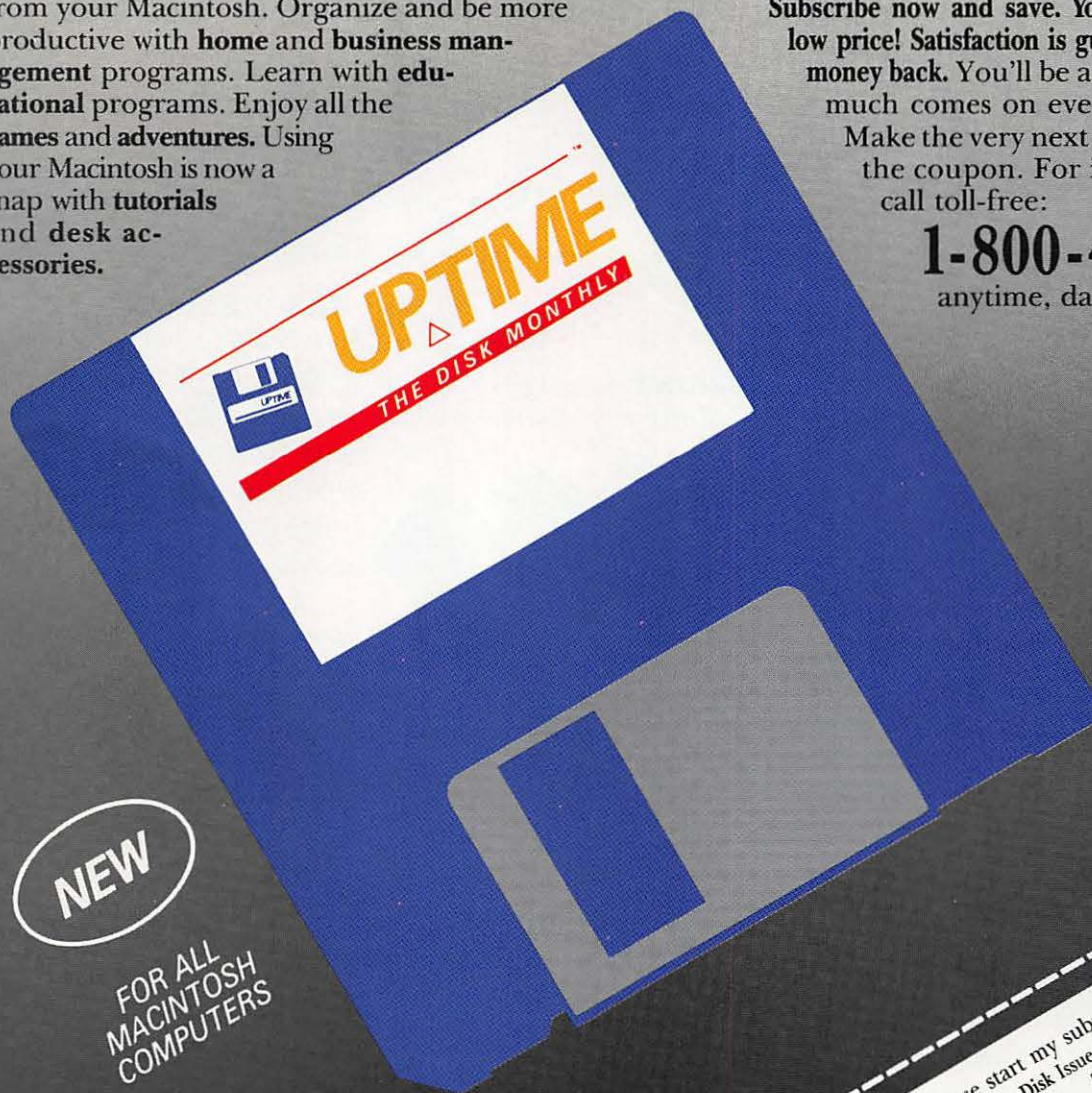
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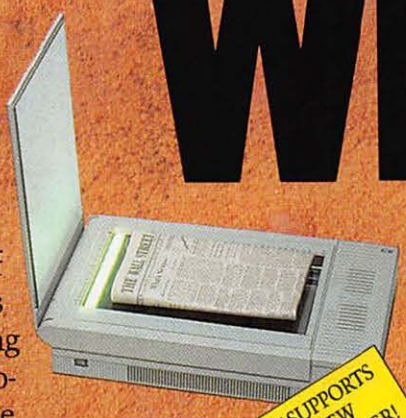
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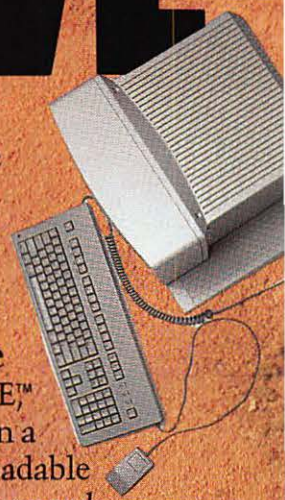
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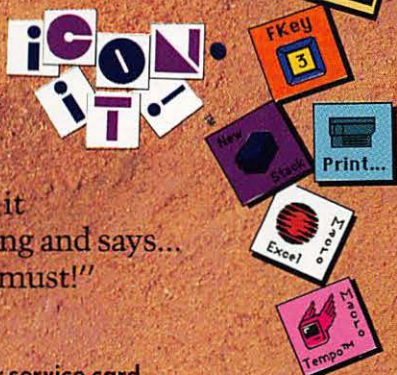
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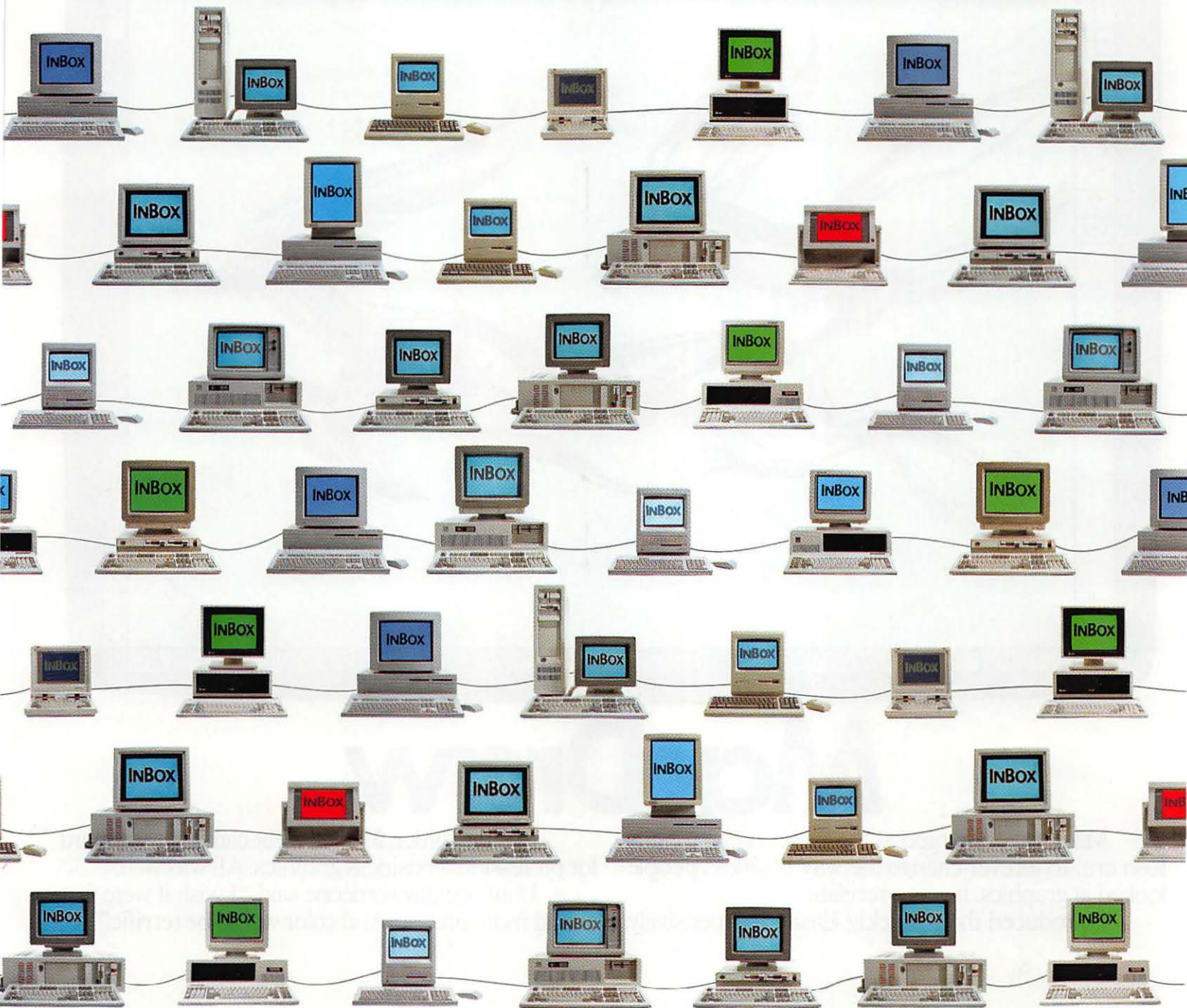
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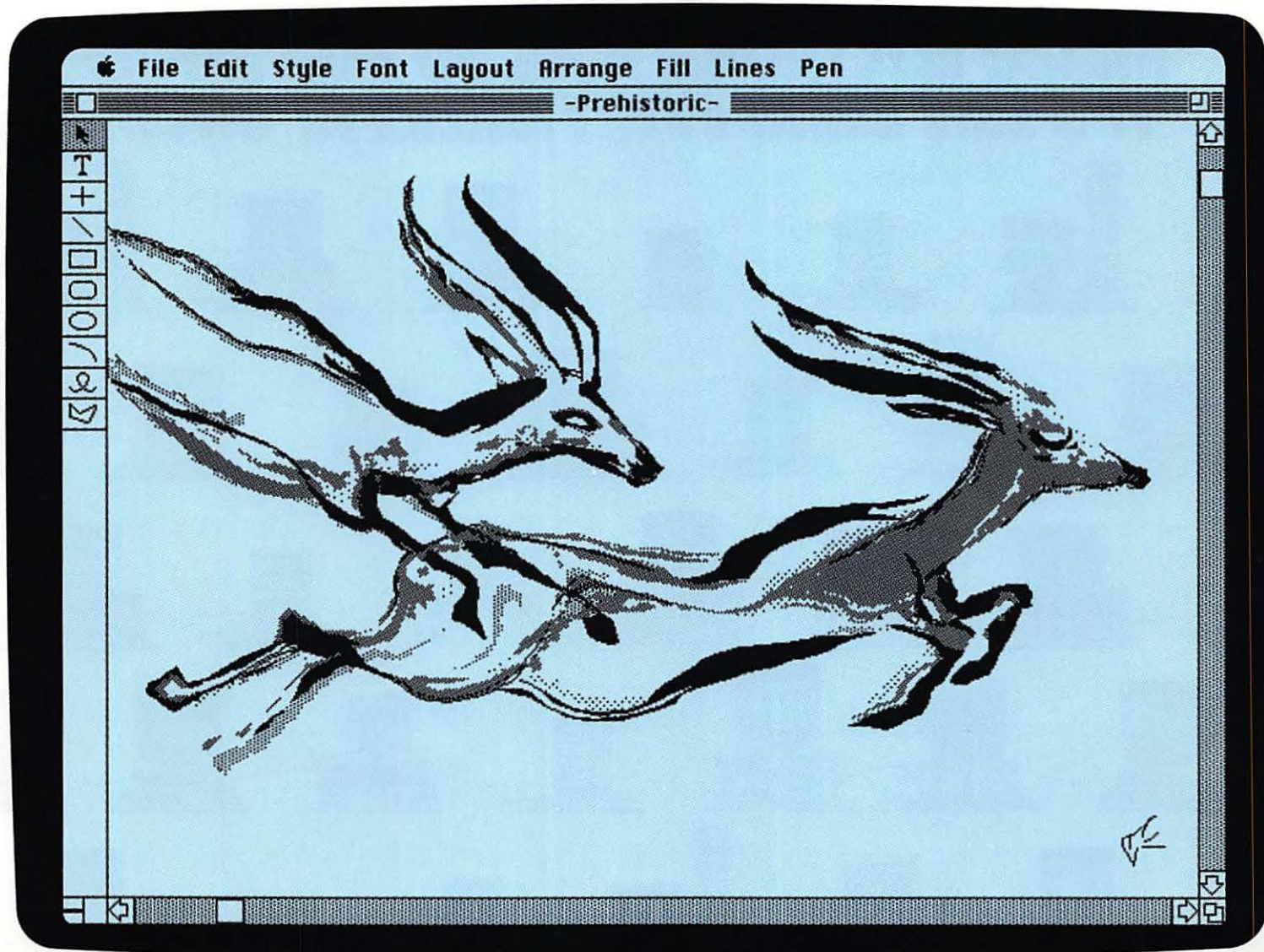
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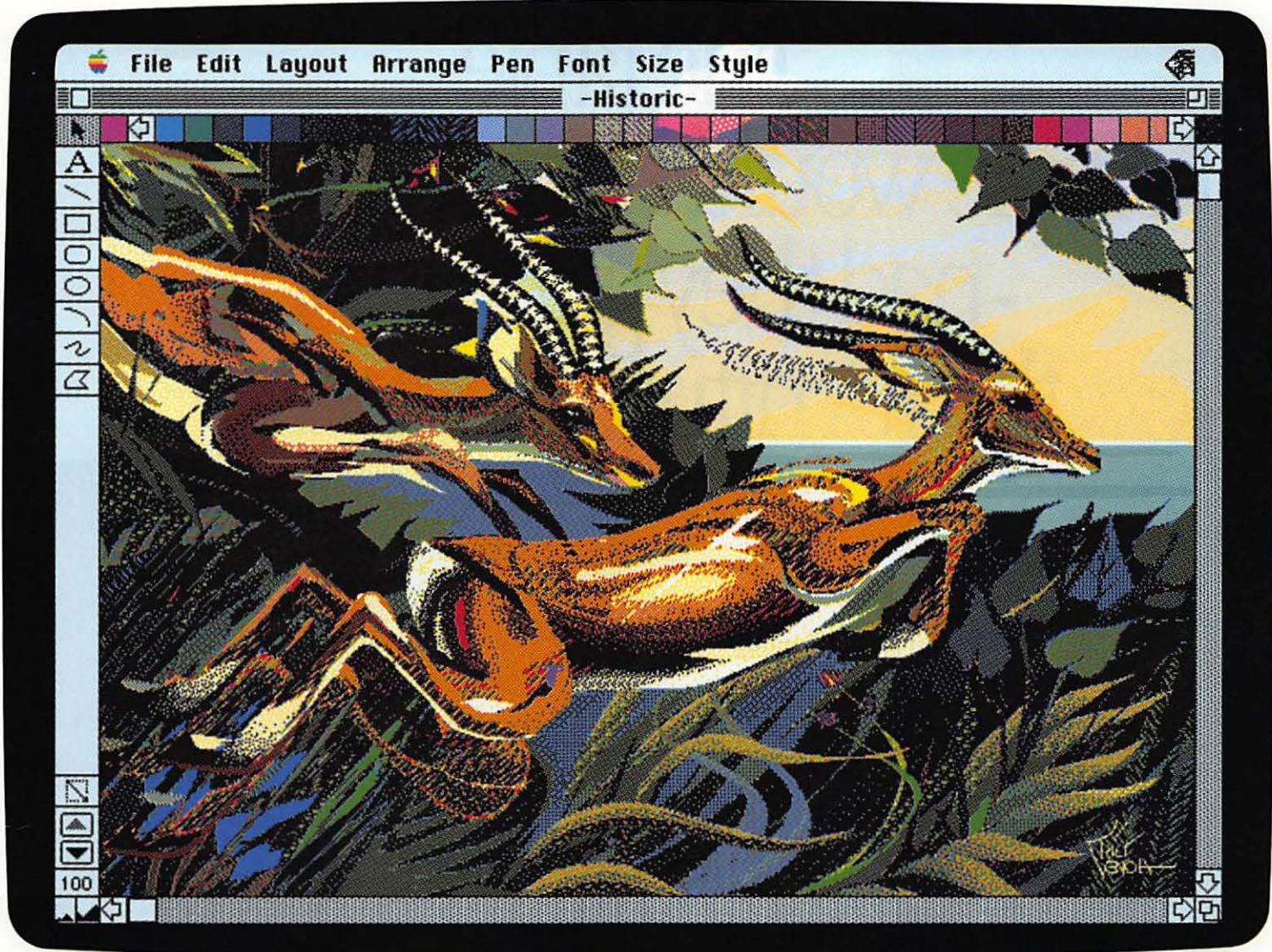
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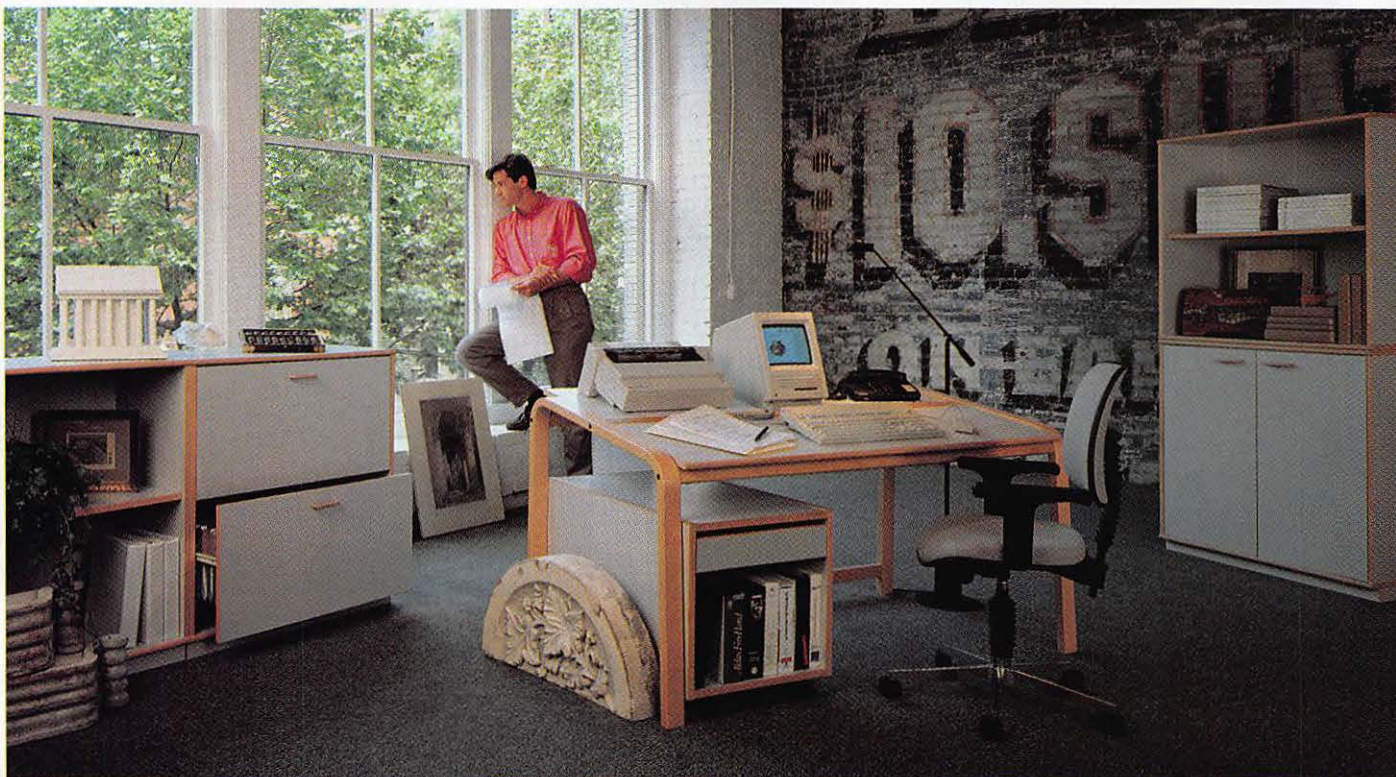
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We, on the other hand, chose to make furniture. More specifically, the MacTable.

Like the Macintosh itself, the MacTable was created to put information at your fingertips, quickly and easily. We accomplish this by thinking of the workspace not as an inflexible monolith, but as a network of individual surfaces onto which you can place each of your Mac components, like your printer, modem, external drive, mouse, even manuals. Everything with plenty of elbow room, easily within reach, and there when you need it.

Next, each surface tilts to optimize your eye-to-screen and hand-to-component

efficiency. Rest assured that as your comfort increases, so does your productivity.

Finally, there's the overall design — sleek, contemporary, and mindful of the future of your computing needs. Because MacTable's surface panels can be arranged, your workspace can accommodate any model of Macintosh, from the Plus to the Mac II... to who knows what.

Surprisingly enough, all of this Mac-like versatility and European beechwood framing is more than affordable: only \$289 for MacTable and \$139 for the optional roll-away cabinet (doubles as a Laserwriter stand); \$269 for the matching, ergonomically balanced chair; lateral file cabinet \$239; bookshelves \$119; and two-door cabinet \$159.

MacTable. It's the workspace that organizes the tools that organize your life. And it's available by calling (800) 722-6263 which, by the way, is not Apple's phone number.

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Circle 296 on reader service card

News from Apple

▶ Apple has announced new versions of AppleShare File Server and AppleShare Print Server, along with news about a Mac Plus bug, and problems to be found in older Mac II monitors.

Version 2.0 of the AppleShare File Server improves server administration, start-up time, security of data, applications, and user information. AppleShare Print Server now concurrently supports up to five printers when running with AppleShare File Server on the same Macintosh server. Users can continue to work while documents are printing, and they can make changes in the print queue. AppleShare Print Server can be accessed from an Apple IIe, an Apple IIGS, a Macintosh, or an MS-DOS computer on a network.

If your Mac Plus hangs on start-up when connected to a SCSI device, like a hard drive or tape backup, you may have the original 128K ROM, which has problems that have since been corrected in revised ROM versions. To work around the problem, power up the SCSI device or disconnect it.

You can check the ROM on a Plus by pressing the interrupt switch on the programmer's switch and then typing DM 400000. If the third byte value displayed is EA, you have a revised ROM, but if it's EE, you have the original 128K ROM. Type G to return.

Some early High-Res RGB Monitors for the Mac II may exhibit a shimmer or jitter lasting up to 90 seconds during the first 20 minutes after

the monitor has been turned on. Those trained in adjusting the Vertical Hold (normally factory preset) can adjust that or exchange the main logic board. If your Mac II's warranty has expired, Apple provides an extension program that offers free repairs. For further information, see your Apple dealer.

Popular Database Goes Multiuser

▶ Nashoba Systems has upgraded FileMaker Plus, which reportedly has 45 percent of the Mac database market, to FileMaker 4, with the addition of multiuser functionality and more than 50 enhancements. This upgrade provides more numerical calculations such as running totals, running counts, weighted averages, fractions of totals, and fractions of subtotals. Also added are various report-layout functions such as magnetic grid pattern, T-squares, and the ability to change font type, size, and style within fields.

Filemaker 4 will run on Mac networks, with or without a file server, and is targeted at small- to medium-size businesses that need to compile, publish, or share lists of information. The program supports multiple levels of password protection and allows creation of confidential files. FileMaker 4 lists at \$299.99 for a single user, and \$599.99 for a four-user pack. For further information, call Nashoba Systems at 415/578-1970.

Modern Jazz Discontinued

▶ After fighting an uphill battle against shipping delays and bugs, Lotus Development Corporation has decided to discontinue further work on Modern Jazz and concentrate on developing 1-2-3 for the Mac. The company will, however, continue to support and offer Jazz version 1A.

A thorough review of Mac development efforts determined that Modern Jazz no longer fits into Lotus's long-term product strategy. Despite the shelving of Modern Jazz, Lotus is committed to developing software for the Mac.

Master Piece, System Saver, and Mouse

▶ Kensington Microware has two new products, Master Piece Mac II and System Saver SE.

Master Piece Mac II is a power control center that organizes the Mac II's power with a special computer outlet and four peripheral outlets. They each have individual and master switching, all protected by surge suppression and EMI/RFI noise filtering.

The power center also provides modem/telephone line surge suppression circuitry through two RJII modular phone jacks, to protect modems from electrical disturbances that occur on phone lines. Master Piece Mac II also offers a swivel to alter monitor viewing angle, all for a list price of \$159.95.

System Saver SE is a similar product for the Mac SE, offering the same surge protection and a choice of one or two front-mounted power switches to control system power. It replaces the Mac's power cord, has two outlets for peripherals, and lists for \$79.95.

Another new Kensington product is the \$169.95 Turbo Mouse ADB with two buttons. One button offers the normal mouse clicks while the other performs six common functions: Save, Print, Open, Close, New, and Quit. For further information, call Kensington Microware at 212/475-5200.

Tektronix Emulation

▶ Grafpoint, a company that specializes in Tektronix graphics terminal emulation software, is making color graphics software available for the Mac II that was previously available only for MS-DOS computers.

TGRAF-07 can display 16 colors concurrently with a resolution of 640 by 480; TGRAF-15LF has the same resolution but can display up to 256 colors simultaneously.

TGRAF-07 (Tektronix 4107 emulation) sells for \$995 while the TGRAF-15LR (Tektronix 4115 emulation) retails at \$1495. For further information, call Grafpoint at 408/446-1919.

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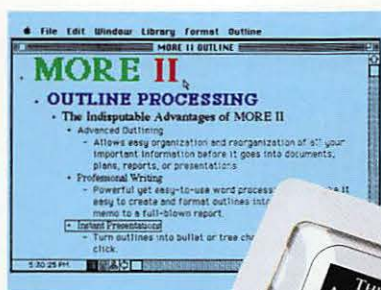
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Users Ultimate Winners of Contest

► A MacHack contest held in Ann Arbor, Michigan, was won by Allan Foster of Portland, Oregon, for two INITs: SFVolMenu and RearWindow. SFVolMenu puts a pop-up menu with a list of drives/volumes where the Drive button usually is, for example in any Open dialog box. RearWindow lets you drag an icon from one window in the Finder to another without changing the window order.

Jay Zipnick's Dumbo, a detailed animation application running under MultiFinder, won second prize. Third place went to OverTime, a permanent clock/date box that can be moved around the Mac screen, written by Darin Adler and Sean Parent. The fourth place finisher, a useful F-key from Bill Johnson and Ron Duritsch called Slider, allows you to grab several or all Mac windows at once and move them in unison. Fifth place went to Shrink Windows by Shane Looker, a program that does exactly what its name suggests.

Watch for most of these winning programs to start appearing as public domain software on bulletin boards around the country. Unfortunately, Zipnick can't distribute his Dumbo program because the rights to the Dumbo character are owned by Walt Disney.

8mm Tape Backup

► Genius's high-speed 2.2-gigabyte Mac tape backup drive, 2Gig, which uses inexpensive 8mm videotape cartridges, can move data at 15 megabytes per second, with a burst speed of 1.5MB per second.

The new \$4995 tape drive can exchange tapes with similar backup systems for DEC's VAX minicomputers and Sun Microsystems' workstations, and it will be especially useful for backing up network file servers or for storing large files like color images.

Backup and restore software will be included with 2Gig, along with utilities for reading and writing data in non-Mac formats. Other 8mm tape drive manufacturers are PCPC, Jasmine, and Abaton. For further information, call Genius at 818/905-0922.

Shares Screen Across Many Miles

► WOS Data Systems, which recently merged with Farallon, is now offering two unique communication products: Katmandu and Timbuktu.

Timbuktu is a desk accessory that lets Macintosh users view and operate each other's computers on AppleTalk. It allows a host's screen to be displayed on a guest user's screen. A guest's mouse and keyboard can be used to operate the host's computer directly. Through password protection, each user controls who can connect to his or her computer. The Timbuktu package runs on the Mac 512KE and later models, and retails at \$99.95 for one user, \$189.50 for two, and \$495 for six.

Katmandu enables you to record screen images of a Mac session and then play them back to do things like demonstrate applications, teach special features to Mac users, or show a series of illustrations. Katmandu's looping tape fea-

ture can also play a repeating message.

HyperCard users without Katmandu can play tapes recorded with Katmandu by using an XFCN included with the product. Katmandu is available for the Mac 512KE and later models for \$99.95. For further information, call WOS Data Systems at 913/843-8101.

Mainframes Get Closer

► Mainframe information could become much more useful to Mac users following Apple's acquisition of Orion Network Systems of Berkeley, California, as a wholly owned subsidiary.

Orion, which markets IBM-compatible Systems Network Architecture software, worked with Apple to develop Mac-APPC, the software implementation of two key IBM SNA protocols that became available earlier this year, Logical Unit 6.2 and Physical Unit 2.1. The product lets Mac applications communicate with IBM and compatible mainframes, minicomputers, and PCs.

Meanwhile, Apple's software spin-off, Claris, may soon compete with Microsoft Word and PageMaker, thanks to its recent purchase of high-end word processor technology from Quark International.

Two from France

► Two applications from France could turn the heads of graphic designers and architects. Architects will be especially interested in Gim-eor's Mac Architrion, which integrates 3-D designs with 2-D elevations and a database that keeps track of every element for later calculations and

generation of bills of materials. A demonstration disk shows how the program builds structures beginning with blocks rather than 2-D elements like thin walls.

Graphic designers will find that Aba Software's Graphist-Paint II-Color (a U.S. name hadn't been chosen at press time) goes beyond normal color painting capabilities to offer many sophisticated editing tools. For instance, any range of colors can be replaced with any other, or with any image. This and other tools make GraphistPaint II-Color into an image processor.

For further information, call Gimeor at 202/223-4373 or Aba Software at 213/644-3580.

Second HyperCard Book

► *Danny Goodman's HyperCard Developer's Guide* is a 550-page tome, useful to serious-minded HyperCard stack developers working in corporate, academic, commercial, shareware, or public domain environments. The 30-chapter book discusses overall stack design, thorny HyperTalk problems, and expansion of HyperCard capabilities using external resources.

This book includes three new XCMDs as examples of external codes to help other developers write their own XCMDs. Available now for \$24.95, *Danny Goodman's HyperCard Developer's Guide* is published by Bantam Books.

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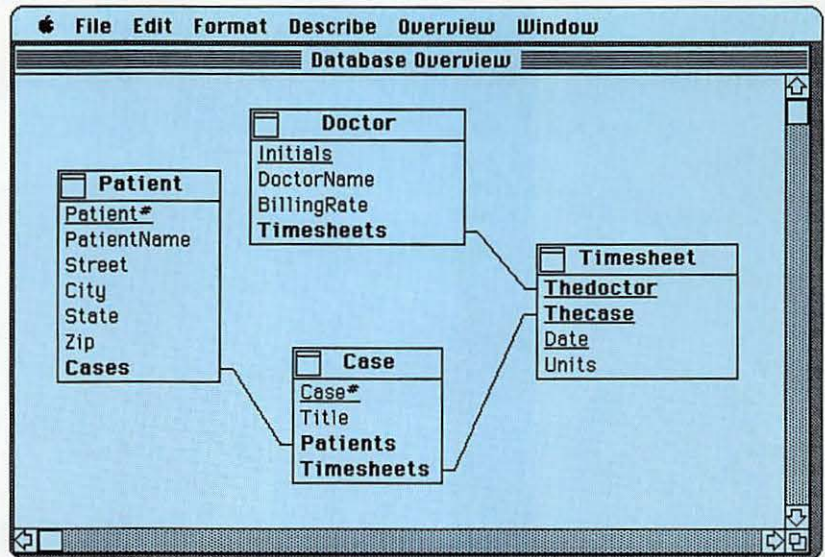
Many "database managers" are not much more than "list managers"—simple lists that can't connect and cross connect one item with another. So while they can "list," they can't really "manage."

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Ten Times Faster than LocalTalk

► Actinet Systems' high-speed 32-bit ARCNet card for the Mac II increases network transmission to ten times faster than LocalTalk.

The NuBus card, called Actinet II, uses a 2.5-megabit token-passing scheme that allows stations to be positioned 20,000 feet apart. It also includes a software driver that runs both AppleShare and Novell's Advanced NetWare.

Actinet II retails for \$695. Actinet also markets Actinet SE. For further information, call Actinet Systems at 415/326-1321.

Connecting Macs to High-End Publishing

► Two companies have announced Macintosh interfaces between their products and high-end page production programs.

Quark has announced interfaces between Quark XPress and Software Consulting Services' (SCS) Layout-8000 and SCS-8000 newspaper page-dumpling systems. Although pricing has yet to be announced, using Quark XPress with the SCS products will reportedly save users 30 percent of the \$50,000-per-workstation cost of proprietary systems.

Unda has announced its interface between Unda Color Design and Production System and the Mac. With the interface, the Sun workstation-based Unda system, which combines color, page design, and prepress production capabilities, will enable designers to create comps and final four-color continuous

tone or spot-color separations on the Mac II. The interface will allow the import of color images in encapsulated PostScript (EPS) or PICT 2 formats used in programs like Illustrator 88, FreeHand, and PixelPaint. For further information, call Quark at 303/934-2211, SCS at 215/837-8484, or Unda at 212/605-0460.

Apple Acquires Corporate DP Access

► Network Innovations, a new Apple subsidiary, is developing CL/1—one of the first connectivity languages for building desktop-to-data-processing applications—for the Macintosh. The company's goal is to make the language a plug-and-play alternative for corporate data processing systems.

Unlike terminal emulations that put a Mac front end on a DP application, CL/1 puts a DP access back-end on a Mac application. Currently, CL/1 is like a device driver you would install in the System file.

Industry watchers predict that CL/1 will eventually be added to Mac System software, may become part of the Mac operating system, and may even be embedded into DEC's VAX operating system.

Virtual Image Shows Two Newspaper Pages

► With the new 21-inch monochrome monitor from E-Machines, you can display virtual monochrome images in a layout as large as two newspaper pages.

The Z-21 displays a 12-by-16-inch viewable area—said to be the largest available in a 21-inch monitor. Two resolutions are offered: 72 and 80 dots per inch (dpi). At 80 dpi, users can see 1280 by 960 pixels, enough to view two A4 pages, including margins. When using the Macintosh standard screen resolution of 72 dpi, users see 1152 by 864 pixels.

Using a video-RAM upgrade which plugs into a specially designed E-Machines video board, the Z-21 can be configured to display 8-bit, gray-scale images at either resolution or on very large virtual screens. The 21-inch monitor is also configured to be especially compact, according to a company spokesperson. The Z-21 monitor is expected to be available in quantity by October. No price has been set.

Moving to System 6.0

► Apple's recent System 6.0 release may not yet offer true multitasking, but it has enough new features and improvements to justify an upgrade for those who have the required 1MB of memory.

Installation If the shareware version of Andy Herzfeld's Quickergraf is already installed in your System Folder, remove it before installing System 6.0's version of Quickergraf, which speeds up the drawing of color screens by about three times. If you don't, accidental selection of the shareware version will most likely crash your system.

Power Feature System 6.0's nicest addition by far is MacroMaker, a utility you can use to create local or global macros of keyboard and mouse commands. MacroMaker's tape recorder metaphor is

cleanly implemented. Clicking on the icon brings up a menu designed to resemble a tape recorder complete with record, play, store, load, and erase buttons. For users who have always wanted to automate repetitive tasks but haven't wanted to tackle QuickKeys or Tempo, MacroMaker alone makes the upgrade to 6.0 worthwhile. (But for those who need macros to carry out complicated or time-sensitive operations, it's best to order QuickKeys or Tempo.)

Better MultiFinder Apple has also eliminated some of the minor annoyances that marred the otherwise efficient MultiFinder. For one thing, when you double-click a document on the desktop to open it, and the application you used to create it is already open, you no longer get a taunting dialog box. Instead, the document actually opens. In addition, MultiFinder now notifies you when background tasks need attention—no more surprise printer paper jams.

More Utilities System 6.0 offers a couple of other pleasant surprises. Closeview is a screen-magnifying utility that displays a rectangular frame that follows the cursor's movement. You specify anywhere from 2- to 16-times magnification and the area in the rectangle fills the screen. CloseView does slow the system, however, especially under MultiFinder or when used with more than eight colors or gray levels.

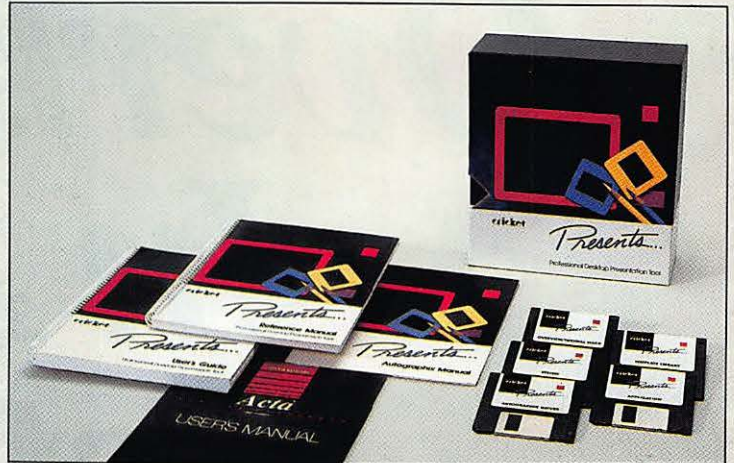
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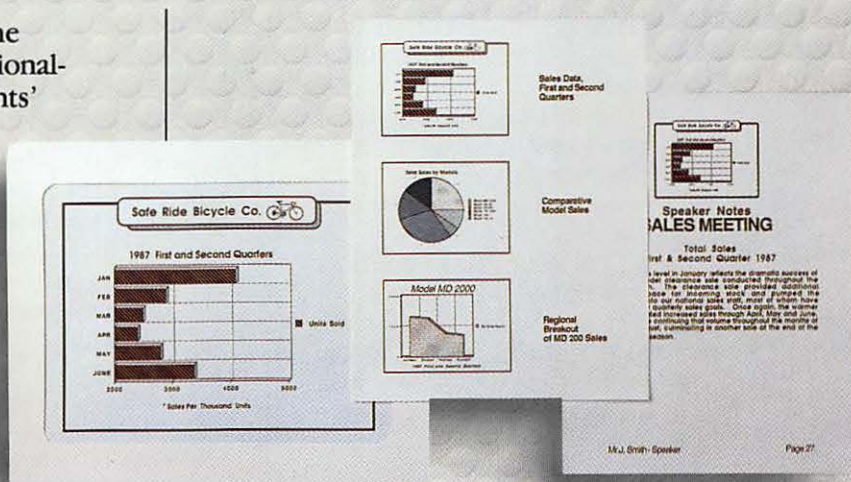
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largest cities, and you can add and remove cities.

Unlimited Fonts Changes to the LaserWriter Page Setup dialog box now include choosing smoothing for bit-mapped text and/or graphics, and unlimited downloadable fonts in a document (you are no longer limited by available memory). The trick here is to avoid getting so font-happy that your printing slows to a crawl. Finally, the dialog box supports postscript printers that allow 11-by-17-inch paper.

Network Upgrades Other new features include Responder, a program that works with InterPol (the AppleTalk Network Administrator's Utility) to help ease network communications. The Apple HD SC Setup can now be used to divide a hard disk into partitions for other operating systems such as UNIX, and the PrintMonitor offers a wider variety of options. For instance, you can display the PrintMonitor window on the desktop when printing or access it through the Apple menu; you choose how to display the printing error warning and how (and even if) you want to be alerted when a manual-feed job starts.

Getting It A System 6.0 upgrade, however, is definitely worth the trouble of sorting out any little bugs. If you purchased a Mac, an earlier stand-alone version of System software, or HyperCard between May 13, 1988, and August 5, 1988, you can receive a free upgrade. Updates are expected to be available free through user groups, bulletin boards, and from Apple dealers. If you can't find a free upgrade, you can always find System 6.0 on retail shelves for \$49, complete with manual.

System 6.0 Compatibility

► The following software programs have been tested by Macworld Lab, and their major functions have been found compatible with System 6.0: Microsoft Word 3.02, PageMaker 3.0, MicroPhone II, Turbo Pascal 1.1, MacWrite 5.0, MacPaint 2.0, MacDraw 1.9.5, MacDraw II, Appointment Diary 2.5, SuperPaint 1.1, MacProject II, AppleLink 4.0, and NetSerial.

But some other popular programs have problems with the new System. For instance, MS Works 1.1 is incompatible with MacroMaker. Using MacroMaker leaves unreadable characters to the left of the Works menu—clicking on those characters scrambles the screen. A patch program is now on CompuServe.

Versions of Microsoft Excel earlier than 1.06 have problems with System 6.0, and there's no patching program. (Microsoft recommends upgrading to version 1.5).

When used with System 6.0, FullWrite Professional 1.0 unexpectedly converts a regular document into a thesaurus or dictionary file. To work around this, put FWP's dictionary and thesaurus into a folder and place it in the deepest level of the FWP folder. A replacement disk will be sent to all registered users.

4th Dimension 1.04 gives a system error when you modify the Layout in the Layout Editor. Also, Shut Down cannot be performed under MultiFinder when 4D is open.

Trapeze 2.0 doesn't support some date formats—a fix is in the works.

MacCalc bombs during launch—a patch is on MacNet and CompuServe.

VideoWorks II 2.0 periodically stops during video playback. Unchecking the multitasking box under Preferences clears up the problem.

Smart Alarm won't work with MacroMaker. An upgrade will be sent to registered users.

Beyond Dark Castle works on a Mac II, but has problems running on a Mac Plus. Dark Castle and Apache Strike don't work with System 6.0.

ConcertWare+ version 4 doesn't run with CloseView. To fix it, either remove CloseView or call Great Wave Software for a free upgrade.

QuickKeys 1.1 only recognizes three of its own eight date/time formats.

Dollars and Sense 4.1 crashes with System 6.0. Contact Monogram Software at 213/533-5120 for more information.

Several pieces of hardware also have problems with System 6.0: CMS's hard disk for the Mac Plus hangs up during booting, and Jasmine's MegaDrive can't initialize a disk with System 6.0. Both companies are working on fixes.

Other products reported by their developers to work with System 6.0, include: Illustrator 88, ReadySetGo 4.0, DeskTop Express 1.0, Dow Jones Market Manager Plus 2.01, PictureBase 1.2.3, MathView 1.0, ComServe 1.0, Straight Talk 2.08, MacSpin 1.5, VersaTerm Pro 2.20, Statview 512+ 1.2, Spellswell 2.0F, SmartCom II 3.0b, SmartScrap and The Clipper, PowerPoint 2.0, Canvas 1.01, Font/DA Juggler+, Digital Darkroom, Super 3D, and Quark XPress 1.11.

The Jury's Still Out on System 6.0

► Apple's recent system software release, System 6.0, has received rather mixed reviews from Mac users and developers alike. Even Apple Canada has declined to designate System 6.0 as an official system upgrade, calling it "a temporary system."

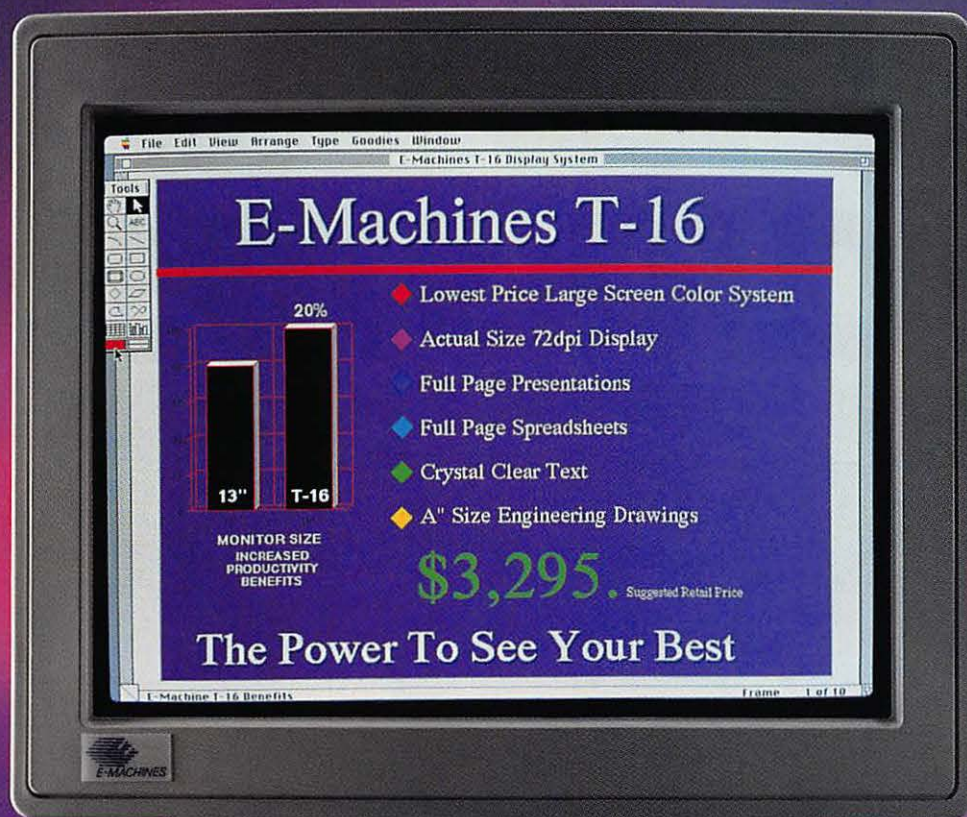
Among the complaints are sound problems on the Mac Plus and SE, and color limitations on the Mac II. There are also print problems and application incompatibilities with a new feature called MacroMaker. In addition, no new ImageWriter LQ drivers were included with the release.

To "fix a few bugs that... are causing serious problems," Apple released version 6.01 of the System file in July. The new System file and new ImageWriter LQ drivers will be included in the Macintosh System Software Update version 6.0. (System 6.01 will become the official System upgrade for Apple Canada.)

The new System file, however, won't fix all the problems being experienced. Apple cautions that the overall incompatibility with third-party applications will probably remain. According to tests performed at Apple, many applications exhibiting problems under System 6.0 also suffer compatibility problems with System 5.0. Thus, many application developers may have to update their programs to make them fully compatible with the new System. □

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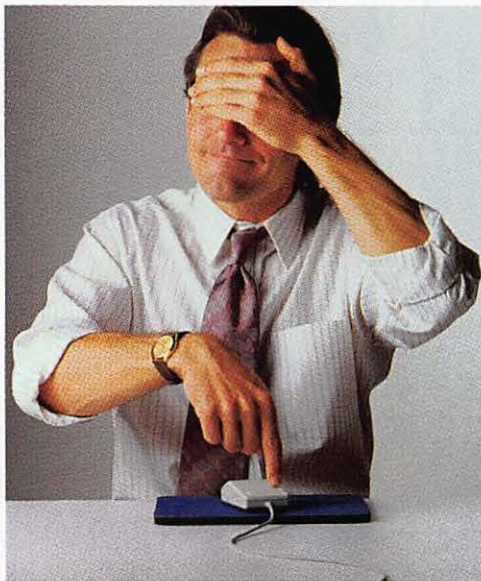


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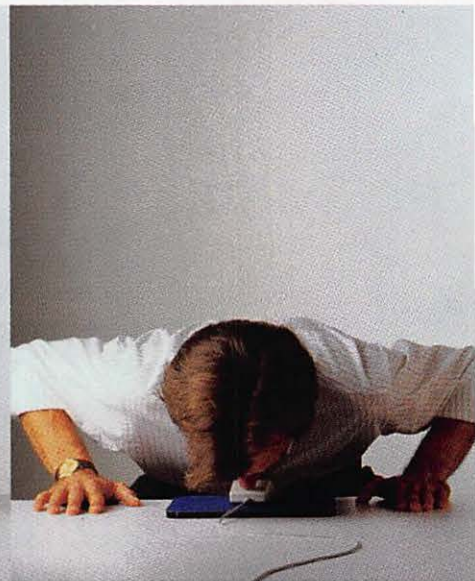
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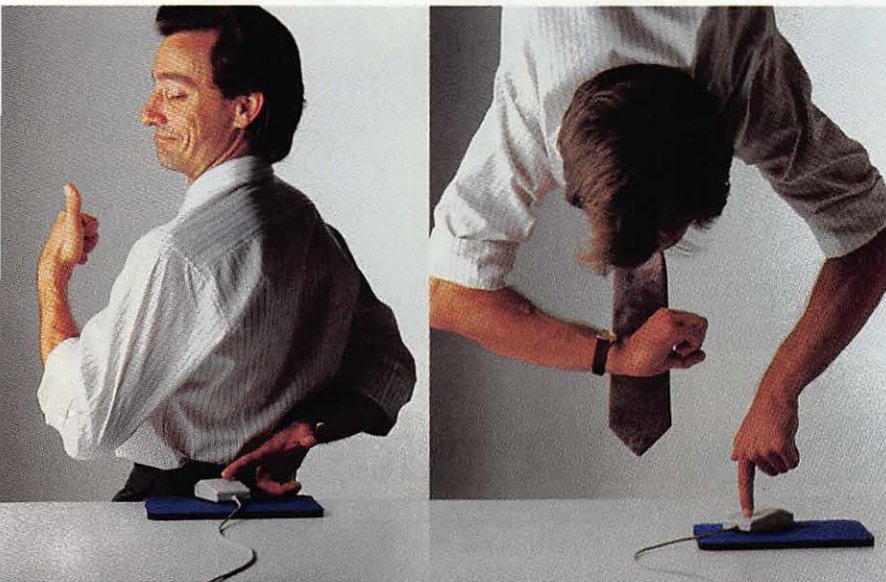
Frank: You bet, Chet. With the lengths people are going to, I'm sure this is going to become a major international event...

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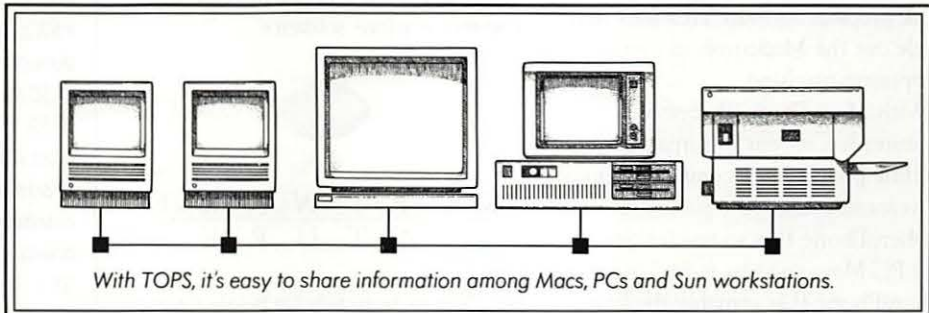
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"MicroPhone is a breakthrough in communications software . . ."



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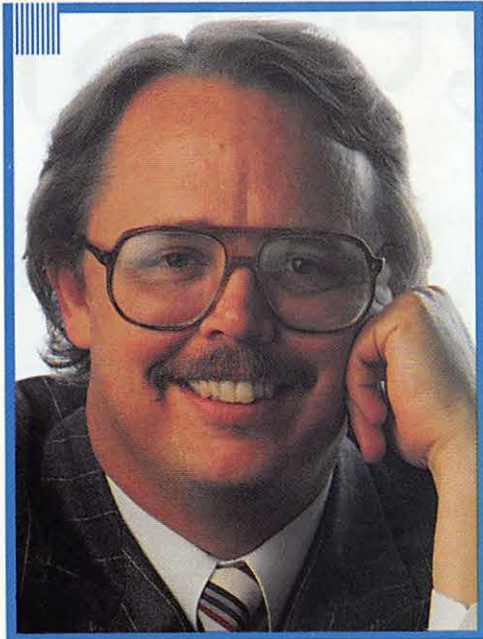
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Much Ado about OS/2



Apple should quit its lawsuit while it's ahead. It has nothing to fear from OS/2, and everything to gain by making further inroads in the business market.

In my opinion, Apple Computer's lawsuit against Microsoft Corporation and Hewlett-Packard, for allegedly infringing on the Mac screen display copyright, is totally unnecessary.

Why? Because the OS/2 Presentation Manager, which Microsoft is developing for IBM, is not much of a threat to the Macintosh. And neither is Hewlett-Packard's New Wave. Apple's fear is way out of proportion on this one.

The fact is there is currently no major new software that runs under OS/2. That means Apple has at least a two-year lead on IBM in its interface technology and in innovative application software.

There are other factors in Apple's favor as well. One is the current shortage—and the artificially inflated price—of dynamic random access memory, or DRAM, chips.

In 1986, I predicted that the United States–Japan semiconductor agreement, which set a so-called fair price on the chips, would inflate memory prices and slow down the growth of the industry.

Unfortunately, I was proven right. Because of that pact, the price difference between United States and Japanese chip prices has widened. A year ago, for example, 256K DRAM chips sold for about 50 percent less in the U.S. than they do today. In Japan, the price has increased more slowly over the same period—by 30 percent.

To use OS/2, you need at least two megabytes of random access memory (RAM). Most PC users only have 640K. At current rates, the cost of upgrading a PC to run OS/2 is going to be about \$2500. Most PC users won't want to spend that kind of money, especially when OS/2 really has no perceived value. It will be at least three or four years before there's enough excitement about OS/2 and the Presentation Manager to make people want to buy those machines in sufficient quantities to make them a new standard.

Meanwhile, the Macintosh is here now. People are going to get tired of waiting for OS/2. For one thing, they'll have to

wait longer than they anticipated because of the usual technical difficulties, which is normal. And actual implementation of OS/2 will be delayed even more because of the shortage of DRAM chips, thanks to that semiconductor accord.

Furthermore, there is much confusion in the IBM marketplace, because companies don't know whether to develop OS/2 applications for 80286-based AT-compatible machines, or to wait until Microsoft comes out with a new OS/2 that works solely on 80386 machines. Developers are also confused about whether they should develop applications for Microsoft Windows now, or wait for the OS/2 Presentation Manager. Some are even questioning whether they should bother to develop programs under MS-DOS.

All this confusion is bound to slow down the development of any meaningful application software under OS/2, which will enable Apple to firmly establish itself in the corporate marketplace.

Then, when the Presentation Manager finally appears, it will actually stimulate software development for the Macintosh. Why? Because it will be a cinch to port Windows and Presentation Manager-created software over to the Macintosh.

There will undoubtedly be a lot of file compatibility between the two systems, too. We already have products like Excel and PageMaker that run under both the Macintosh operating system and MS-DOS. As files are transferred more easily from PC to Mac, Apple will become even more of a presence in the field than it is now.

If Apple would call this battle off now, there wouldn't have to be any losers. I think the consumers, developers, stockholders, and employees of all three companies—Apple, Microsoft, and Hewlett-Packard—deserve a break. Apple should quit worrying whether the Presentation Manager will steal the Mac's glory and concentrate on developing a cheaper, faster laser printer. □

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For the young novice angler looking to launch the hobby with tamer game, *On the Fly* will offer a range of smaller, lighter, less intricate lures, such as the Peanut Piper, the Pumpkin Puff,



the Weedy Wiggle and the Puddle Jumper. These lures are designed for easy handling, both on and off the hook. For the reel man who chums for larger catch, the new additions to our 1989 product line include the Chimmer Swizzler, the FinchDog Fighter, the Man-Boy Behemoth and the Brassy Bottom Bonanza. These additions for 1989, plus the full line of tried-and-true *On the Fly* lures are on the following pages.

Lure, line & sinker.

Our *On the Fly* authorized dealers have long been aware of both our in-store and customer support services. This season is no different. In fact, in addition to our advertising budget, we have plans to expand our in-store displays and re-package the lures for easier inventory and handling.

PROJECTED SALES FOR 1989*		
	CHIMMER	BONANZA
100K	NO	YES
50K	YES	YES
25K	YES	YES
10K	YES	YES
5K	YES	YES

Hold the anchovies.

For our customers, we plan to initiate a toll-free 800 number to widely distribute information such as matching lure to fish, bait tips and techniques, hot spots for fishing and spawning cycles. With this service, the fishing line of our market will always be busy.

* SALES FIGURES FOR 1989 ARE JUST A WILD GUESS


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For the reel man who chums for larger catch, the new additions to our 1989 product line include the

Chimmer Swizzer, the FinchDog Fighter, the Man-Boy Behemoth and the Brassy Bottom Bonanza. These additions for 1989, plus the full line of tried-and-true *On the Fly* lures are on the following pages.


The Brassy Bottom Bonanza

Lure, line & sinker.











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Hold the anchovies.

For our customers, we plan to initiate a toll-free 800 number to widely distribute information such as matching lure to fish, bait tips and techniques, hot spots for fishing and spawning cycles.

With this service, the fishing line of our market will always be busy.

PROJECTED SALES FOR 1989*

	CHIMMER	BONANZA
100K		
50K		
25K		
10K		
5K		

*Sales figures for 1989 are just a wild guess

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B R A V O

MacCalc

*O*f the many spreadsheets available, one and only one gives you the ease of learning, ease of use, raw speed, and the most visually compelling and flexible formatting available — MacCalc.[®]

A basic reality of the use of computers and software is that faster is better. Period. MacCalc is the fastest spreadsheet. Period. Faster than Excel, faster than any other Mac spreadsheet. And that's not just opinion; this fact has been proven repeatedly in tests by MacUser, MacWorld, MACazine, MacWEEK, & InfoWorld. MacCalc's incredible performance lets you work more smoothly — more naturally.

Speed

Ease

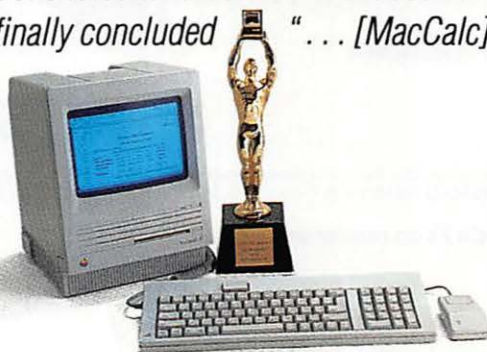
*M*acCalc was designed to give every level of user easy access to all of its capabilities, so all of that speed doesn't go to waste while you learn the program — you get flying right from the start. MacWeek summed it up rather well, "MacCalc answers the frustration of Excel users — MacCalc is exceptionally easy to use."

*W*ith desktop publishing level formatting abilities, MacCalc users produce stunningly professional presentations of their information, and that lets them get their point across not only faster, but better. With unique fonts, sizes, styles, and/or formats for each cell, individually variable row heights as well as column widths, you can highlight important numbers, make titles stand out. . . in other words, make your point.

Style

*M*acCalc's extensive list of features include: Lotus 1-2-3 file/SYLK data compatibility; cell notes; on-line help; intelligent database functions; keystroke macros (via Apple's MacroMaker); and much more.

*W*ith MacCalc's list price only \$139, Infoworld concluded that MacCalc is "the clear value leader." MACazine stated unequivocally that "MacCalc is the spreadsheet of choice for those who want useful functionality without undue complexity," and finally concluded "... [MacCalc] is a must have."



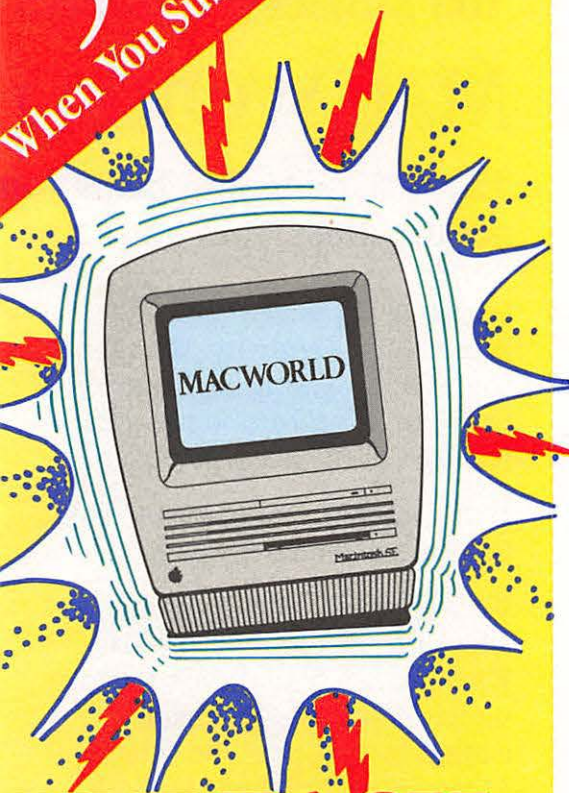
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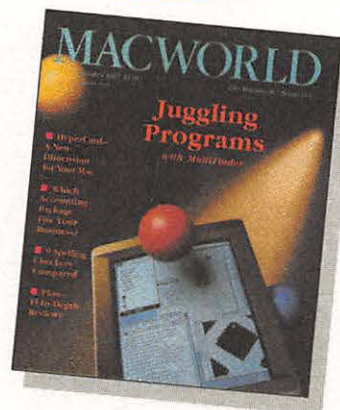
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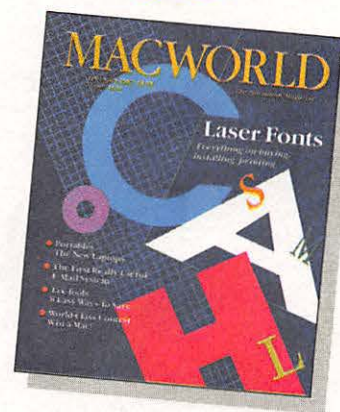
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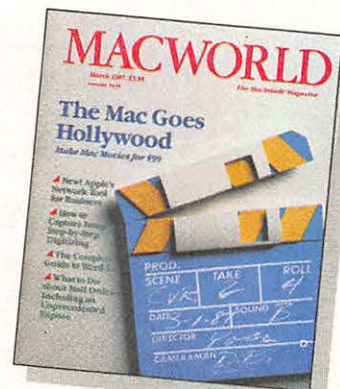
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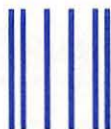
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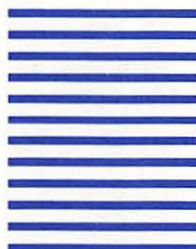
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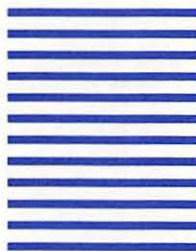
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Letters

A forum for Macworld readers

Electronic Trojan Horses

New App Stack, as described in *Mac Bulletin* (May 1988), sounds more like a *Trojan Horse* program than a computer virus. A virus can reproduce itself in other computers—for example, by attaching to messages traveling over a network or slipping onto a floppy disk. It must also be self-executing so it can renew the cycle.

Like its Homeric counterpart, a Trojan Horse is an apparently friendly program that, when invited into the unwary user's computer, will do something nasty. But unlike a virus, a Trojan Horse requires active participation to run; it does not reproduce or execute itself. As Cassandra might have said were she a Mac user, "Beware of bulletin boards bearing gifts."

Mike Lingle
Costa Mesa, California

Corrections

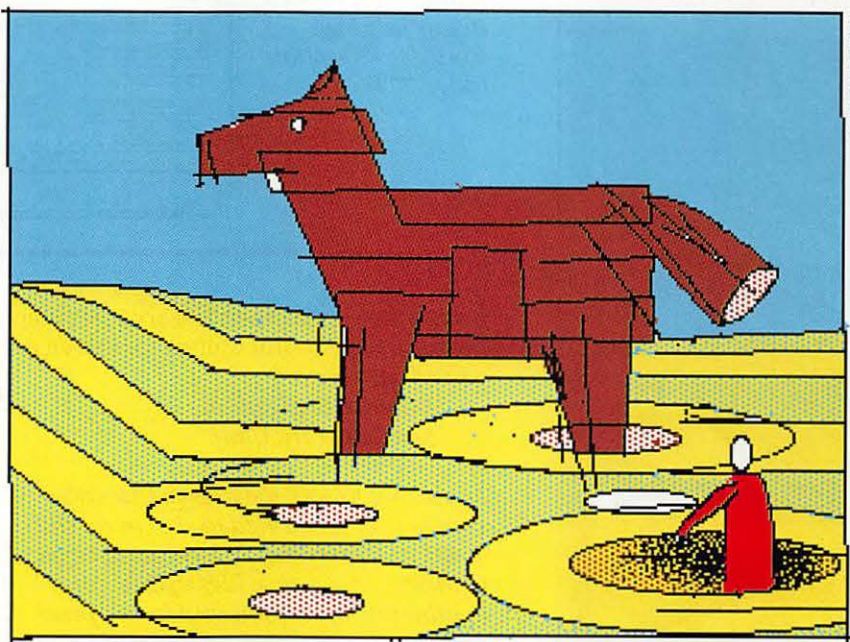
Orbital Mech ("Gravity at Play," April 1988) requires only 512K of RAM, not 1MB. To order, call Studio Zero's toll-free number, 1-800/752-9222, ext. 933.

NYMUG's address ("Users Friendly," May 1988) is 688 Sixth Ave., New York, NY 10010, 212/691-0496. Current membership rates are \$40 for the first year, \$32 for renewals.

Apple Computer's ImageWriter LQ ("Apple's Junior Business Printer," May 1988) retails for \$1300.

The phone number for Techware, maker of *Understanding PageMaker* (Where to Buy, June 1988), is 407/695-9000.

The phone number for Marklin, maker of *Digital Starter Set* (Macworld News, June 1988), is 414/784-8854.



A Blind Eye

Our product MacCalc was overlooked in "Getting Started with Spreadsheets" (July 1988), although a number of MacCalc's exclusive or unique features (including variable row height, cell formatting in different fonts and styles, and cell notation) were mentioned without the proper attribution. Also, all Mac spreadsheets use the IEEE standard of 14 digits, not just Excel.

Richard A. Ross
Bravo Technologies
Berkeley, California

Although the column wasn't intended to be an assessment of every Mac spreadsheet, it should have contained some references to MacCalc, especially regarding the features you've mentioned. We regret the oversight. —Ed.

Manual Enhancement

Your review of our memory enhancement product, MacSnap Plus 2 ("RAM Cram," April 1988), provided accurate technical information but found our installation

manual lacking. We've responded to constructive criticism from our customers and reviewers by completely updating our documentation.

E. Kyle Tynner
Dove Computer Corporation

The new manual is much improved. Not only is it well organized, but the installation procedures are accompanied by illuminating illustrations. —Ed.

Vaporware Headaches

Relying on advertised vaporware (Steven Levy's column, "The Vapor Papers," April 1988) can cause major headaches—and not just when it comes to software. Case in point: AST's advertising of the Mac86 card for the SE. We purchased an SE for our counseling center in November 1987, counting on AST to deliver the Mac86 and Mac286 cards promptly (reportedly due in October). First the release date was set

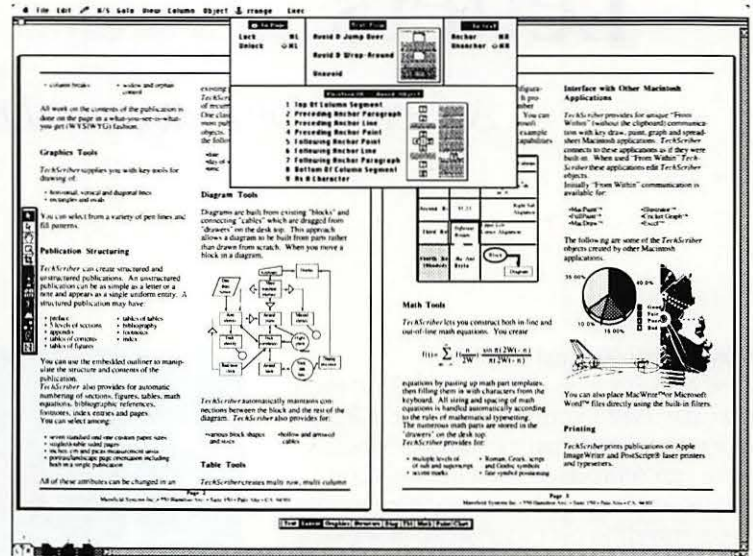
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Take The Long View

Letters

Corrections

What You Saw Is Not What You Get
Sample output from TechScriber—a modular WYSIWYG document processor from Mansfield Systems—as it should have looked in our July Macworld News section (page 77).



back to December, then January 1988, then March, and we're still waiting for this vital part of our system.

David S. Bridgeman
Salt Lake City, Utah

According to AST, the delayed Mac86 card is now scheduled to ship in the fall of 1988. AST's Product Information Group (714/863-9991) provides updates on availability of current and future products. The company also has a BBS (714/660-9175) where you can post technical and other questions about AST's Apple products.—Ed.

Suppressing the Surge

Your recent review of surge suppressors ("They Can't Hurt," May 1988) overlooked our company, a leading supplier of power equipment. The review also stated that surge suppressors can't protect against brownouts; yet some Panamax devices (and no doubt some from other suppliers) do just that.

Henry Moody
Panamax
San Rafael, California

Units with brownout protection typically turn off power to your drives during a voltage drop; they'll protect your hardware but probably not your data. In an area where electrical disturbances are common, you're better off buying an uninterruptible power supply that regulates voltage flow.—Ed.

Unable to Relate

After reading your review of Borland's Reflex Plus ("Learning to Relate," March 1988), I purchased the program. Far from agreeing that "simplicity is its key virtue," I found it the most complicated and confusing Mac software I'd ever seen. Also, I was unable to change my data after entering it (Undo was dimmed about 99 percent of the time).

Walter Malmrose
via CompuServe

Reflex Plus is not a good choice for first-time database users, but then no relational database is likely to be. Because of Reflex's difficulties with changing records and Undo, it's also far from ideal for those with heavy data-entry demands. For a comparison of some easy-to-use file managers, see "Data Basics" in our June 1988 issue.—Ed.

Designer Teamwork

To correct some inaccuracies in "Shape of Things to Come" (Macworld News, April 1988): Apple was a client of Frogdesign's, not of Steven Peart's. Peart was only one member of the team responsible for industrial design of Apple products. Brad Bissell was responsible for the keycap graphics, Sigmar Willnauer designed the Macintosh monitor, and I designed the Apple keyboards, the IIGS, and other peripherals.

Anthony Guido
That
San Francisco, California

(continues)

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MacUser, March 1988 ★★★★★



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BROWSE.

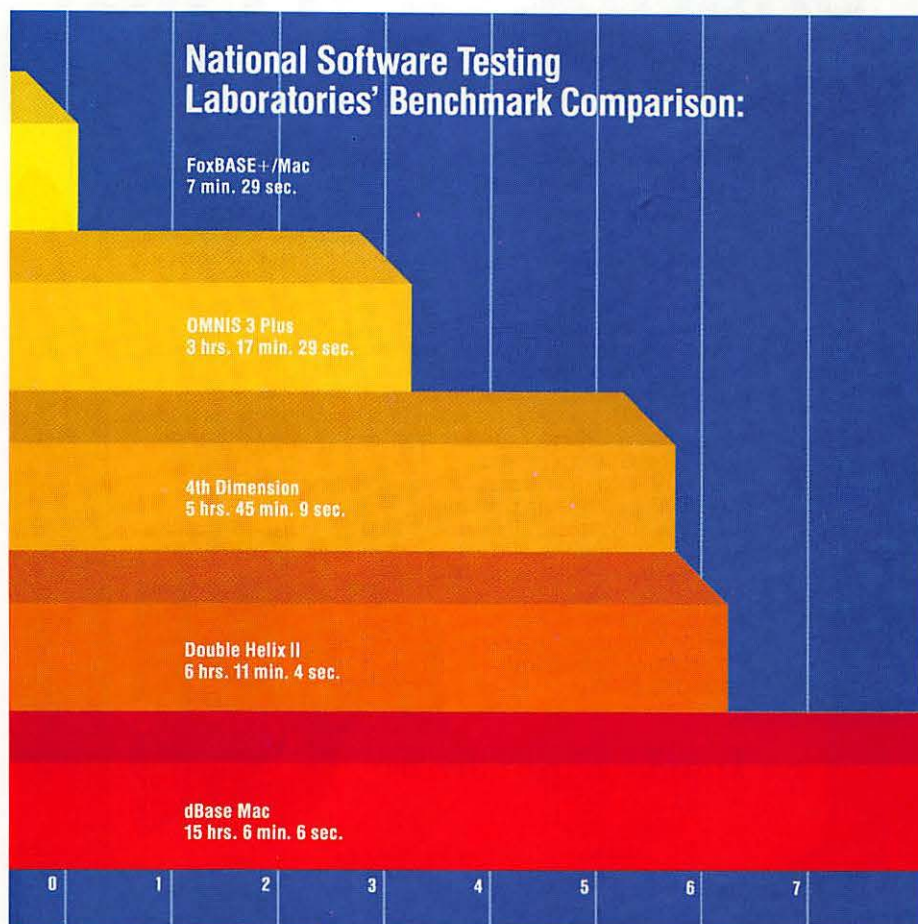
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Letters

From AppleWorks to MS Works

How can I translate word processing, spreadsheet, and database text files from AppleWorks into Microsoft Word, Works, and Excel files?

Paul Cheverton
San Diego, California

If your Apple IIC uses 3½-inch disks, you can translate AppleWorks spreadsheet and word processing files using Apple File Exchange with conversion documents for AppleWorks. You can get these documents by sending \$4 to MacSLUG, P.O. Box 6462, Kent, WA 98064-6462. For more information on file translation, see "Getting Started with Data Exchange" in this issue. —Ed.

More User Groups

I enjoyed your user group article ("Users Friendly," May 1988) but was surprised to find no mention of A.P.P.L.E. Co-op, the oldest national Apple user group. Our Mac membership is over 2000—out of a total of over 10,000. We offer a public domain software library, a technical hotline, a multiline BBS, and a monthly magazine—all for an annual membership fee of \$26. You can contact us at 290 S.W. 43rd St., Seattle, WA 98055, 206/251-5222.

Frank Catalano
A.P.P.L.E. Co-op
Seattle, Washington

Sorry we missed you. See our Directory of Macintosh User Groups in this issue, for a more comprehensive list than the sampling we presented in May. —Ed.

Neglected Fonts

Our LaserPerfect Fonts were not mentioned in "Fit to Print" (April 1988). They come with invisible nonplain screen fonts, obviating the ResEdit gymnastics described in the sidebar. Also, our LaserPerfect Fractions provide an excellent solution for creating fractions. Finally, all LaserPerfect Fonts come with a free copy of CE Software's LaserStatus utility.

Michael Ross
NeoScribe International

NeoScribe (P.O. Box 633, East Haven, CT 06512, 203/467-9880) offers some excellent fonts, including display capitals to complement Palatino; old-style numerals for Adobe's Bodoni, New Baskerville, and Galliard; and several display and spe-

(continues)

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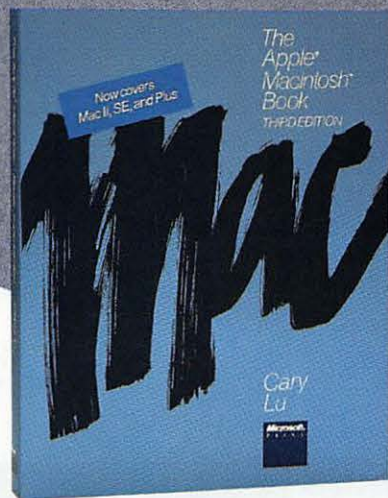


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Letters

cialty fonts. The company also develops custom fonts, characters, and logos. Sorry about the omission.—Ed.

A Couple of Cards

Macworld News (May 1988) points out that Orchid Technology's ColorVue card for the SE is "slow," which is true in itself. However, in conjunction with the Levco Prodigy SE accelerator card, it provides an almost instantaneous screen refresh rate. The two cards were coupled in Second Wave's ExpanSE chassis, which has room for two more cards. It was beautiful to see.

Niles Carter
Austin, Texas

Expressions of Protest

I was dismayed by your review of my program, *Expressionist* ("A Trio of Equation Editors," April 1988). You claimed the program has "few keyboard commands," although 45 are listed in the manual. You also found the palette of 61 buttons "too cluttered," while preferring *MathType's* 180-button palette. One of *Expressionist's* strongest advantages, its ease of use, was not even mentioned. Finally, the review appeared just on the verge of version 2.0's release.

Allan Bonadio
Allan Bonadio Associates
San Francisco, California

We found many of Expressionist's interface features obtrusive at times. In the reviewed version, we found only 14 keyboard commands related to typesetting functions. Unfortunately, version 2.0 was not available when the review was being written. In spite of these flaws, we still concluded that Expressionist is probably the best choice for medium-duty individual users.—Ed.

Keeping Your Mac in Shape

I have a Macintosh with a HyperDrive 20 internal hard disk. Is there any problem with leaving it on for extended periods of time? Since I'm running a BBS, it's on constantly.

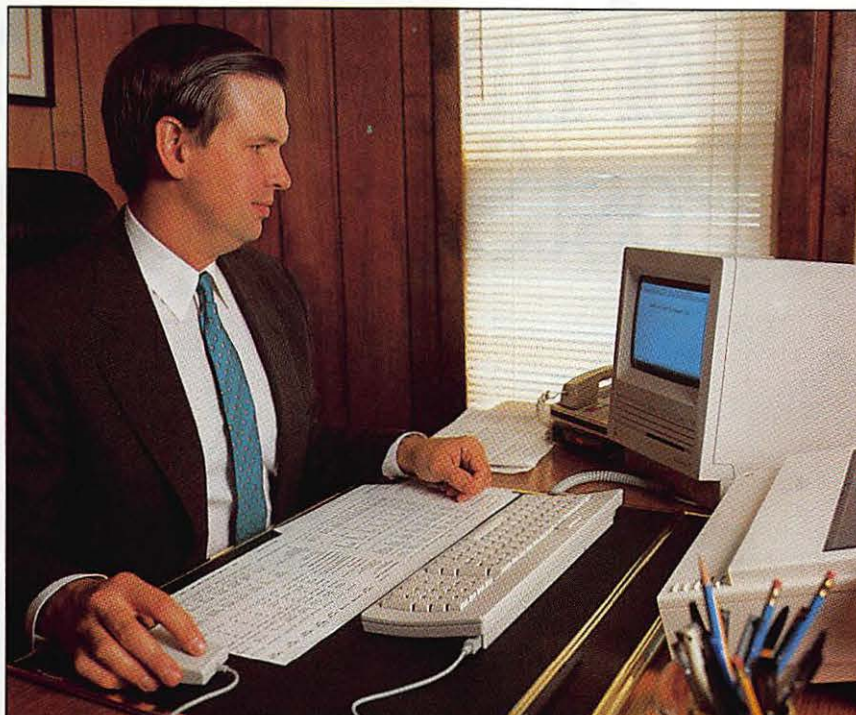
Chris Chadillon
Pointe Claire, Quebec, Canada

We wouldn't recommend it. The heat generated by a constantly running internal hard disk is likely to reduce the lifespan of your Mac.—Ed.

(continues)

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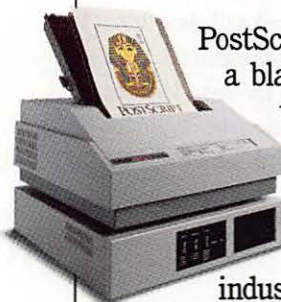


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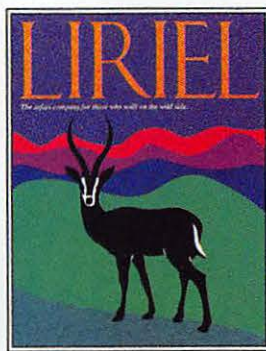
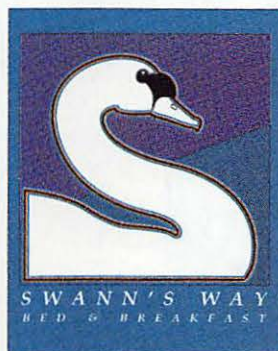
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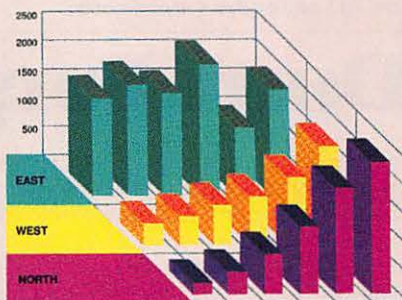


Pictured are just some of the ways designers are using the QMS ColorScript 100. The creative director at one design firm notes: "We're doing comps in minutes that used to take hours. The quality is fantastic."

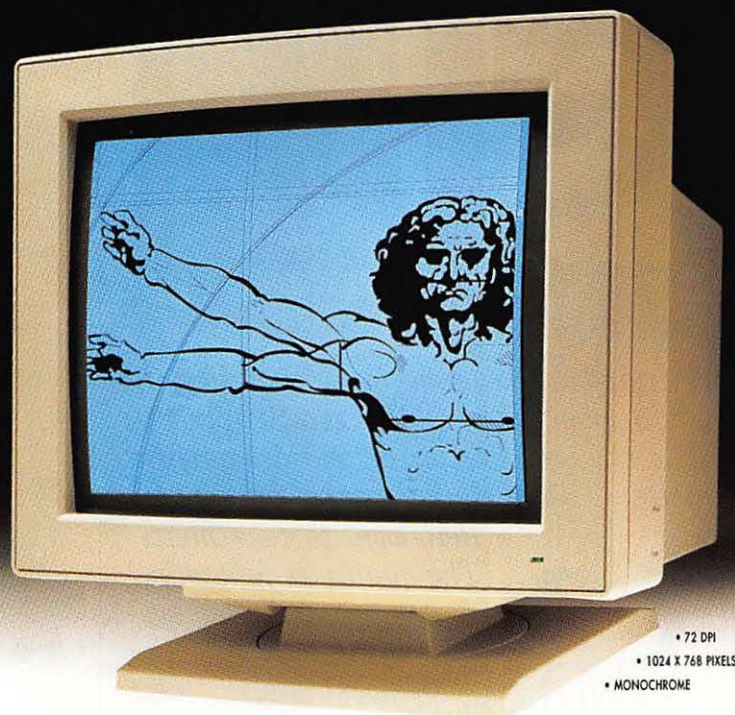
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Letters

That Program Looks Familiar

In "A Familiar Face" (*Letters*, May 1988), a reader commented on the "MacGyver" episode that featured an SE running a facial composite program. We're glad someone noticed, but it wasn't Mac-A-Mug. It was our program—CompuSketch.

Don Summer
Visatex Corporation
Campbell, California

Mixed-up Fonts

After reading Steven Levy's discerning comments in the May 1988 issue, I would like to put a stop to a self-perpetuating myth. The type font, Times Roman (Times New Roman, to be accurate), was not named for the *New York Times* newspaper.

Times New Roman was developed for the *Times* of London (England) in 1931 by Stanley Morison, a typographic consultant to British Monotype Corporation and the Cambridge University Press.

The persistent misconception about this typeface is probably due to the Macintosh screen font, Geneva, which becomes Helvetica (Switzerland-Helvetia, get it?) on the LaserWriter. That logic doesn't hold up when the screen font New York becomes (London) Times Roman. Perhaps *Macworld* can do a little research and find out what typeface is used for the *New York Times*.

Robert L. Creager
Westerville, Ohio

The New York Times sets its type in a modified, copyrighted version of the typeface Old English, which was made exclusively for its own use.—Ed.

Bible Search Software

I need some help with Bible Research Systems' Bible Search program called The Word processor, which I've found troublesome to use.

Barbara P. Morgan
Gretna, Louisiana

Here are some groups that might be able to give you some guidance: Church and Synagogue Group of The Boston Computer Society, 617/367-8080; Computer Applications for Ministry Network (CAMNET), 212/870-3105; ECUNET conferencing system, 1-800/624-5916; and International Church Computer Users Network (ICCUN), 206/525-1213.—Ed.

(continues)

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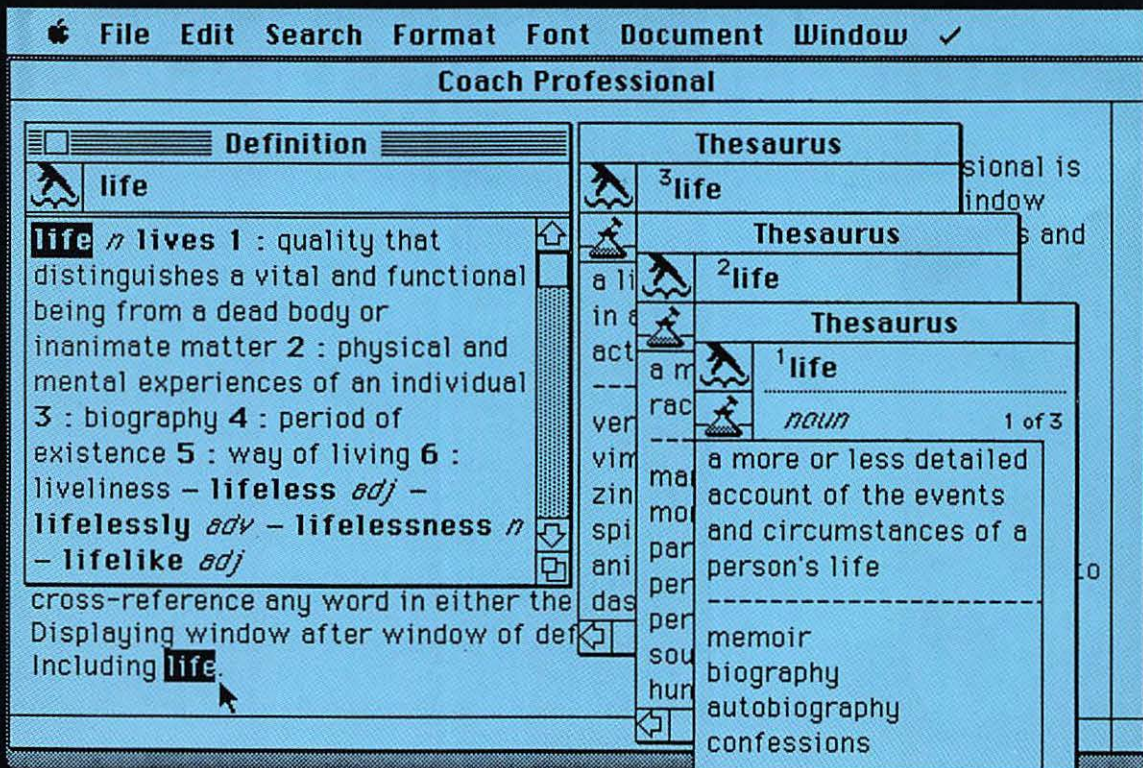
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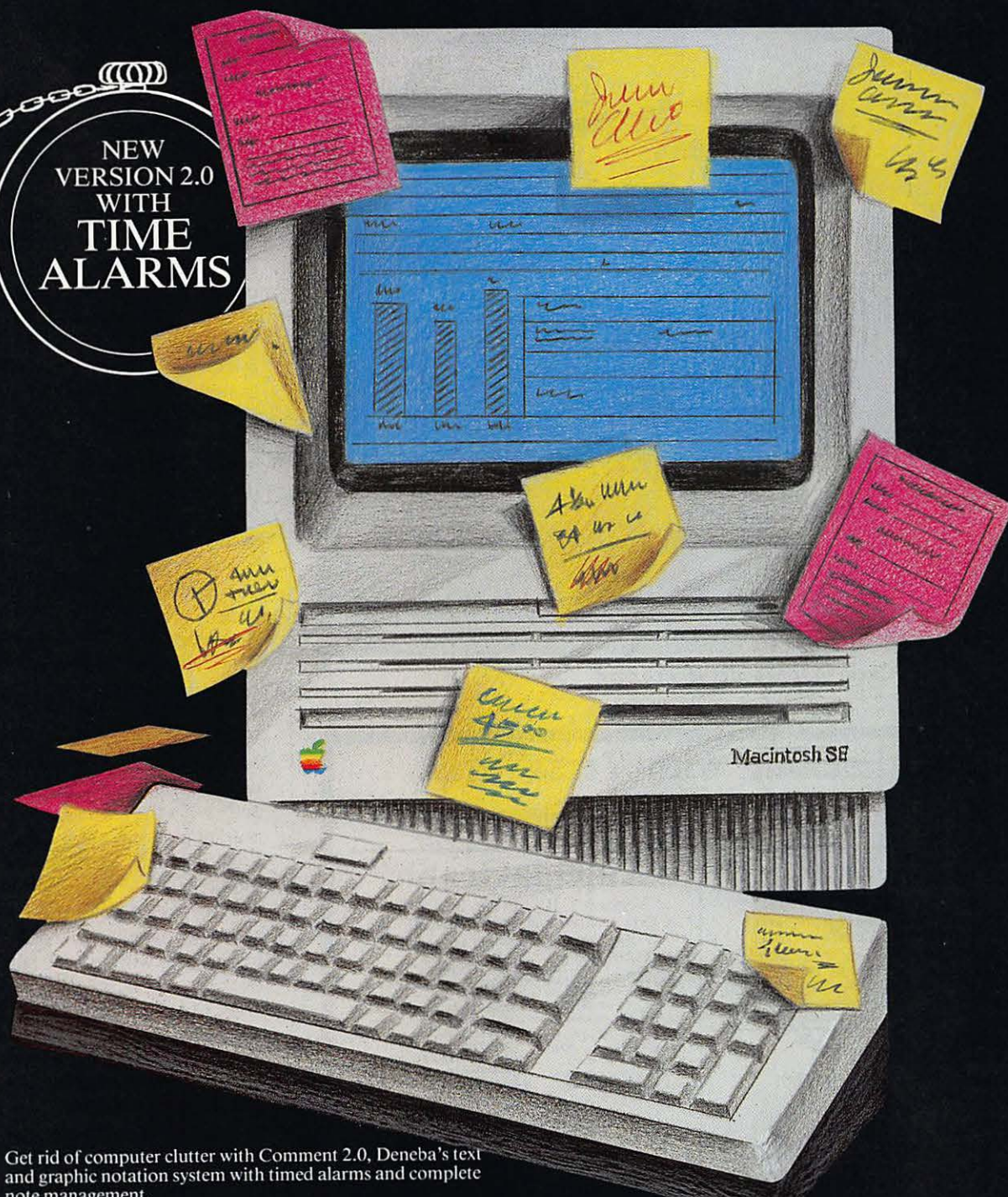
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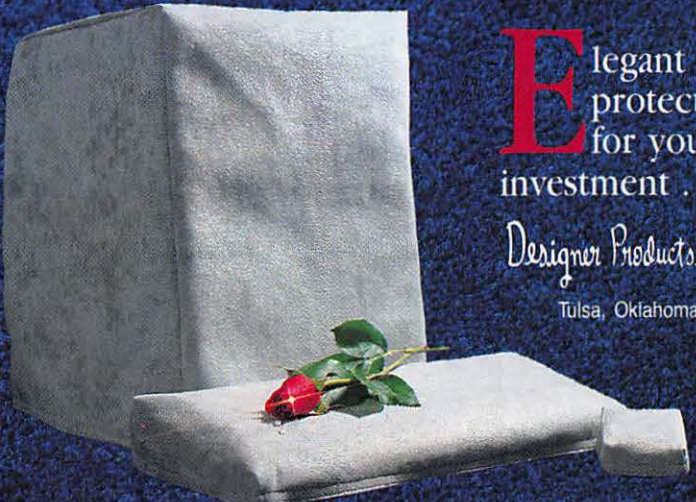
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Letters

Ironing Out Upgrade Problems

I recently upgraded to a 512KE and then upgraded to MacPaint 2.0 and MacWrite 5.0. I ran across a few problems that I thought others might like to hear about.

The 512KE upgrade includes System 4.1 and Finder 5.5. They work fine on my 512KE with all my software except MacWrite 5.0 and MacPaint 2.0. When I use MacWrite with System 4.1, the spelling checker apparently copies the document into the Clipboard before checking the spelling. Then I get an error message claiming that the Clipboard is too large to transfer to other applications or for use by any desk accessories. When started with System 4.1, MacPaint 2.0 tells me that the snapshot feature and the "magic eraser" will not work due to insufficient memory. I solved both of these problems by copying System 3.2 to the disks. I also discovered that MacPaint will not work with a very large System file (lots of fonts and DAs) on a 512KE.

Larry B. Macy
via CompuServe

Reinventing the Word Processor

We've all been waiting for the ultimate word processor that leaves little to be desired. I have used WordPerfect, FullWrite, WriteNow, MindWrite, ReadySetGo, and Microsoft Word. The time has come when users can and should tell the market exactly what they want, instead of letting the market guess. Why? Because of HyperCard. I would like to see a grand competition for the best user-interface design of the dream word processor. Nonprogrammers can make stacks that show exactly what they want. If the winners are partly determined by vote, in a fashion similar to your annual "Best Mac Products" competition, the software industry will have a clear idea of what we want as well as what we don't want.

Richard Bondi
via CompuServe

Conflicting Data

"Data Basics" (June 1988) is riddled with unfounded assumptions, contradictions, and errors; it lacks understanding of the subject as well as laboratory benchmarks. Among other inequities, Charles Seiter labels our product, 1stDesk, "a loser"

(continues)

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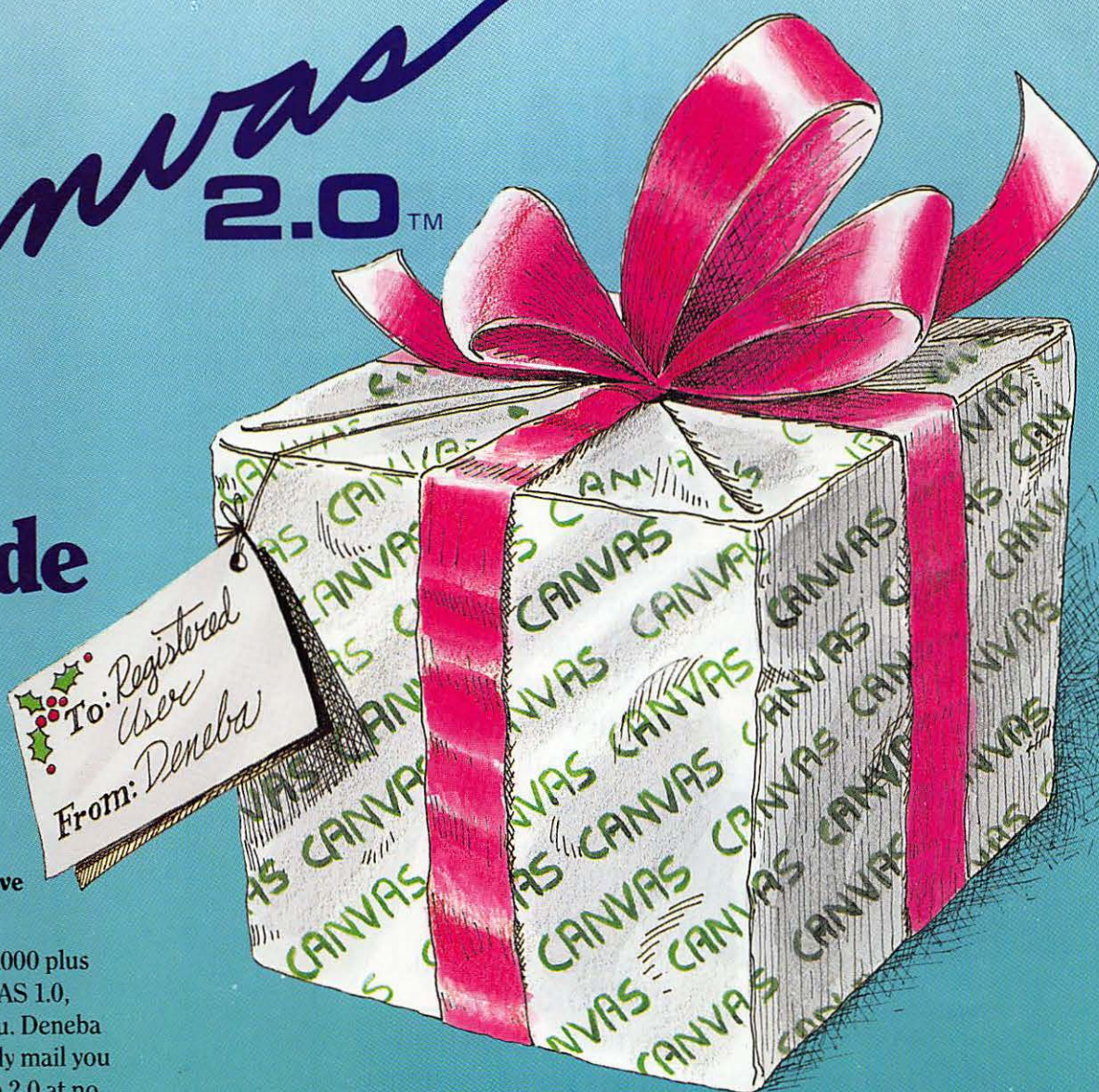
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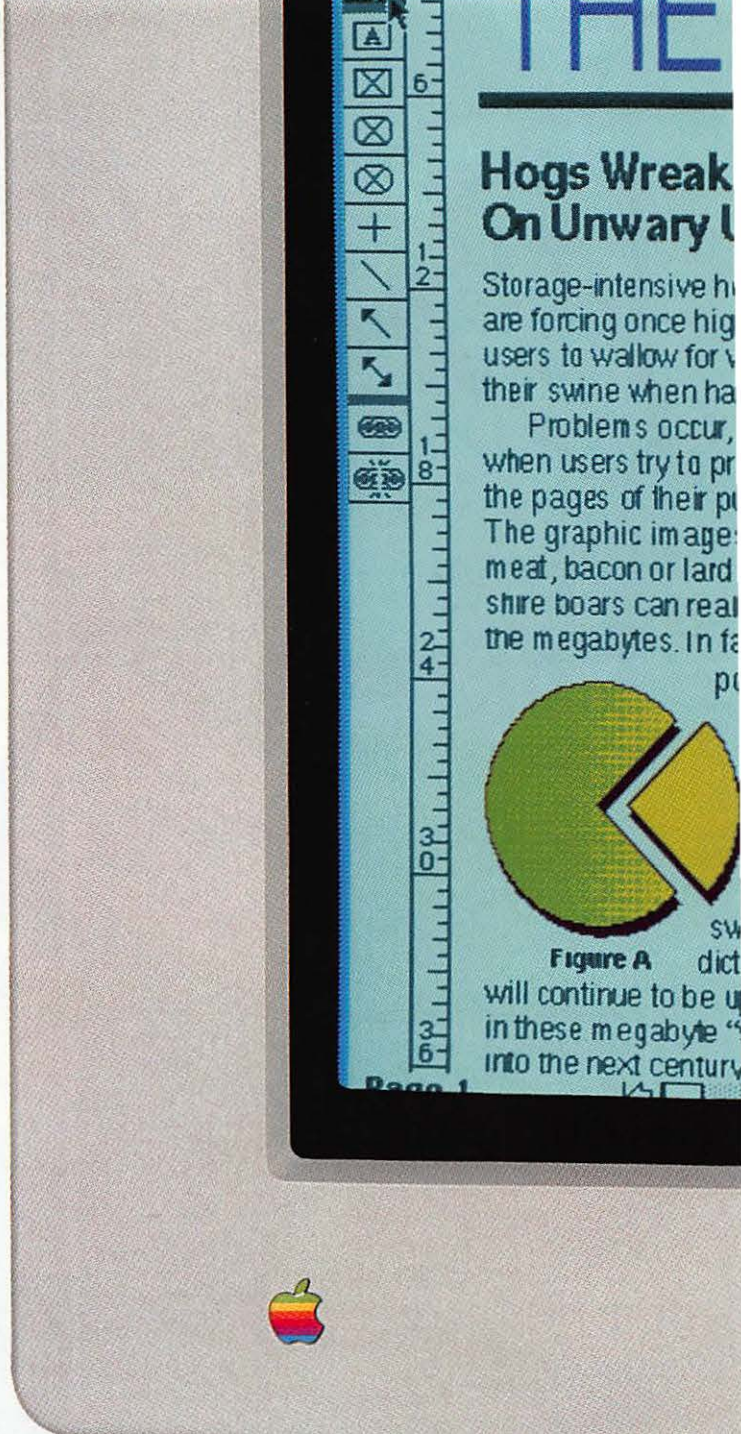
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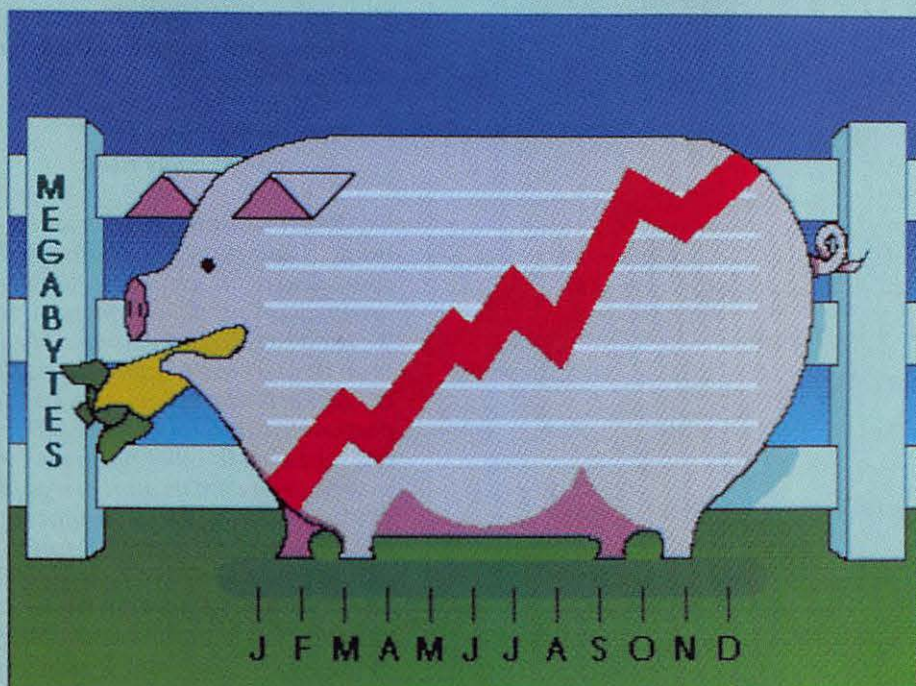
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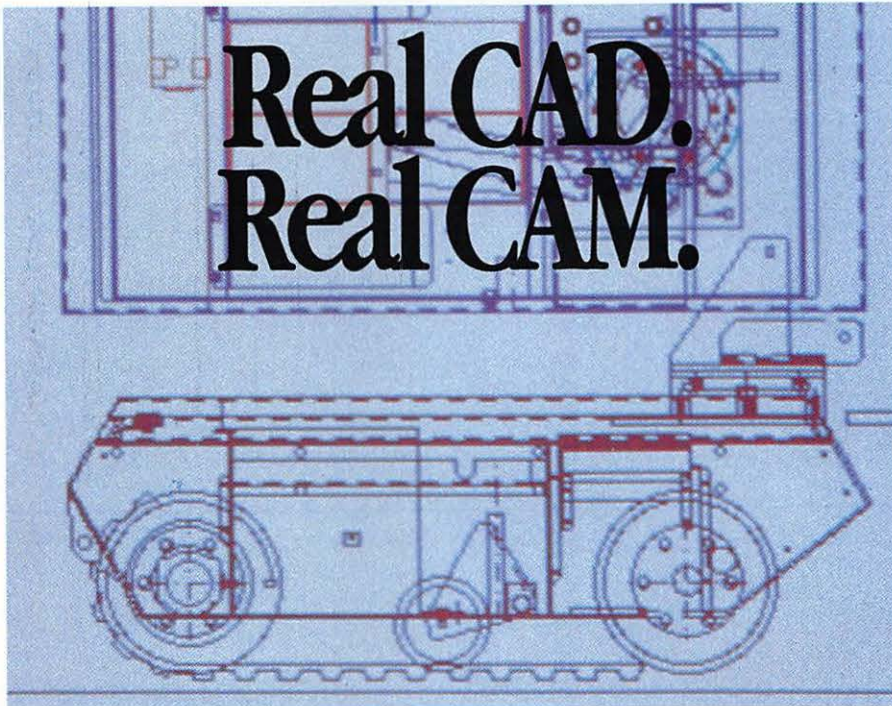
as little, for that matter) as you like. Bernoulli provides the missing link. What else would you expect from the number one company in removable mass storage? So roll your megabyte hogs and your other storage problems into one low-cost solution. Bernoulli Boxes for the Mac are available in three models, in 5¼" and 8" form factors. For more information, see your Iomega Authorized Reseller, or call 1-800-832-5511.

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Letters

with limited mail merge capabilities; uses Microsoft Excel, a spreadsheet, to illustrate a database; and quotes inaccurate performance statistics.

William F. Hulbig

1stDesk Systems

Medway, Massachusetts

We stand by our test results and conclusions. "Data Basics" was intended for users who want something simpler than an applications development system. We used Excel as an example because most readers are familiar with it. To support his evaluation, Seiter points to important features lacking in 1stFile that are standard in other programs. For instance, even with its mail merge package (1stMerge, \$95), 1stFile cannot export files to Word or MacWrite for mail merge, as can FileMaker Plus, Microsoft File, OverVue, and Reflex Plus. In the author's view, this is a standard feature that all file managers should have. Finally, Seiter did acknowledge that not everyone shares his view of 1stFile and pointed readers toward an earlier, more complimentary Macworld review. See the next letter for another positive opinion. —Ed.

1stFile Fan

As an original user of the old 1stBase, I was quite surprised to read the negative review of 1stFile ("Data Basics," June 1988). Among my reasons for choosing 1stFile were its simplicity, its performance orientation, and its ability to process data rapidly and accurately. 1stFile is easy to learn, and our staff has had excellent results with it. Although your reviewer was far less impressed, I do appreciate his honesty in mentioning the positive review of 1stFile in the January issue of Macworld.

A trite but apropos phrase captures the essence of 1stFile: "Try it, you'll like it."

Stephen H. Paul

Philadelphia, Pennsylvania □

Letters should be mailed to Letters, Macworld, 501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe (70370,702), The Source (BCW440), or MCI Mail (addressed to Macworld). Include a return address. We regret that, due to the high volume of mail received, we're unable to respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of Macworld.

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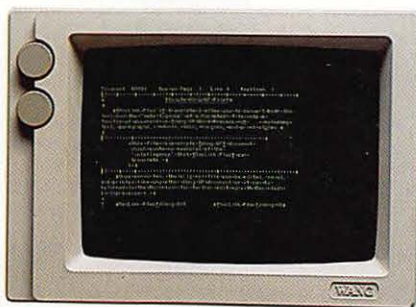


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Wang Word Processing



Microsoft Word

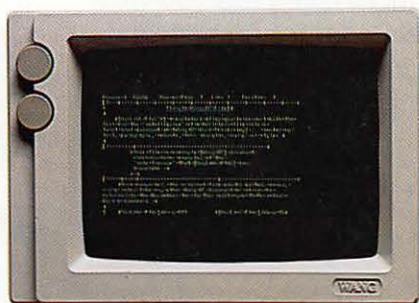
to ASCII or print files is necessary.

MacLinkPlus doesn't stop there, however. It offers full Wang VS Workstation capabilities, allowing easy access to Wang word processing, data processing and electronic mail. All 32 Wang Workstation functions can be executed through familiar Macintosh menus or command keys, and you'll even be able to use the mouse on Wang displays.

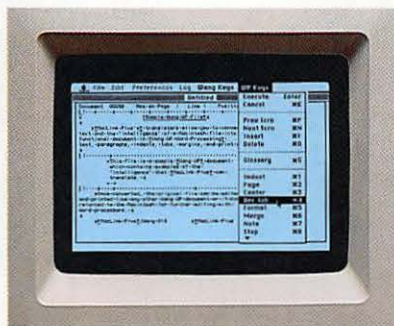
Software for the Macintosh, software for the Wang (8" or 5.25"), software for the PC and a direct connect cable (you can use a Hayes or compatible modem if you prefer), is included in the MacLinkPlus package; everything you need to be up and running in minutes.

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Macintosh 2110 Terminal Emulation



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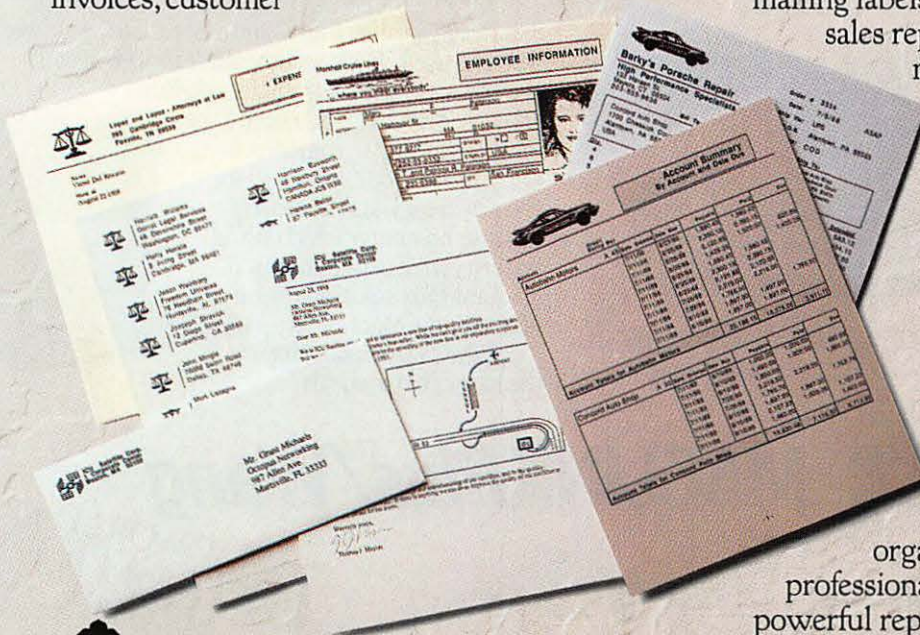
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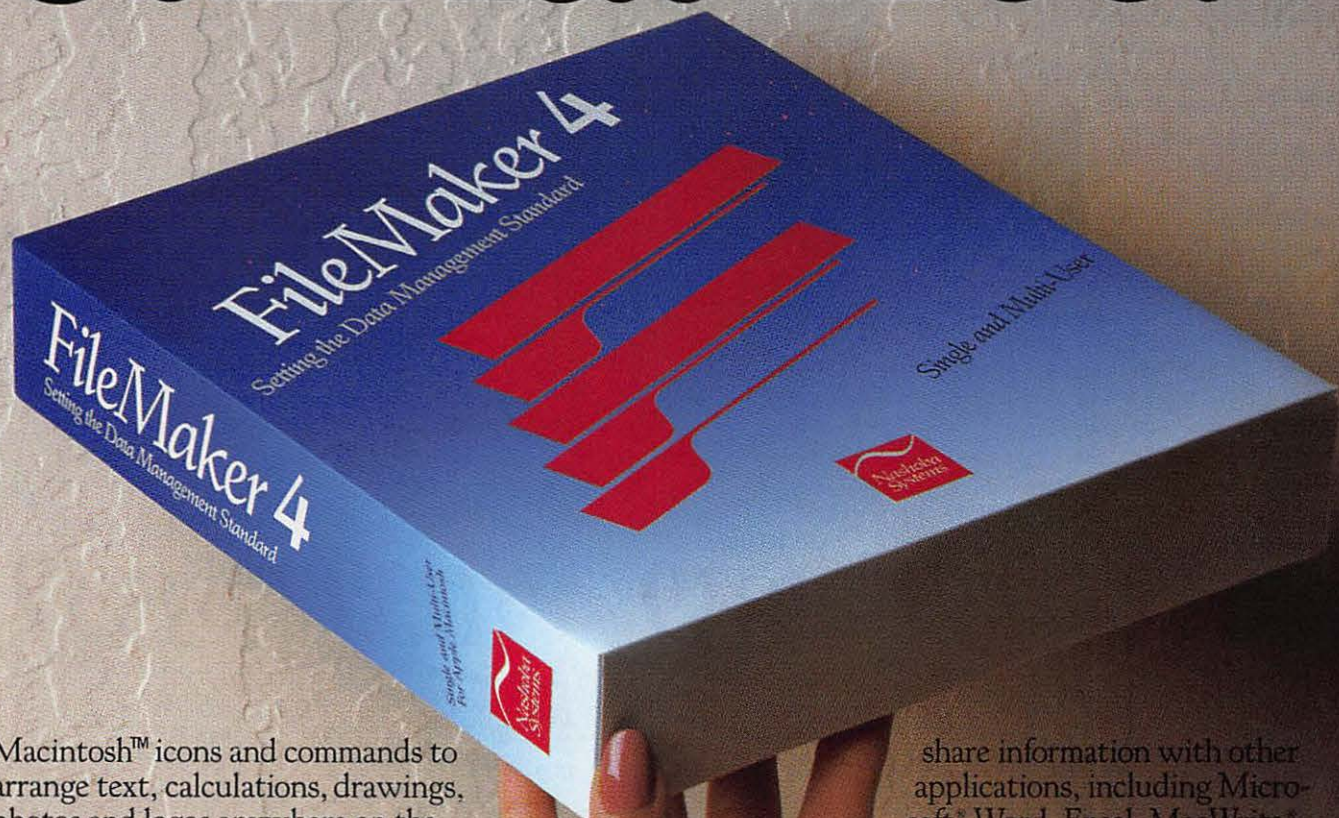
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Is It Real, or Is It Beta?

A preview of the Macworld Expo

Since many of you won't be able to attend the expo in Boston, and since those of us who do attend will be so busy that we'll miss many of the new product announcements there, I offer up this preview of the exposition.

Paint Software

Silicon Beach will be showing SuperPaint 2.0; Dubl-Click Software will be there with Wet-Paint, and Cricket Software will finally demonstrate its paint program publicly.

Among the color paint programs, SuperMac's thunder will be somewhat muffled by PixelPaint's two new competitors: GraphistPaint II from Aba (developed in France) and Photon Paint from Mediagenic (formerly Activision). Both look great. Letraset, another major contender, may show its long-awaited color version of Image Studio.

Draw Software

What about MacDraw II, you ask? Yes, Virginia, it's shipping. Claris left copies with us in late June; now it's on your dealers' shelves. Deneba's Canvas and Aba's Draw It Again, Sam both have new features that make them worth looking at again. Adobe Illustrator and Aldus's FreeHand, now archrivals in illustration/drawing software, are hard at it. Illustrator 88 began shipping late in June. Its new features have enabled Illustrator 88 to gain ground against FreeHand. Stay tuned.

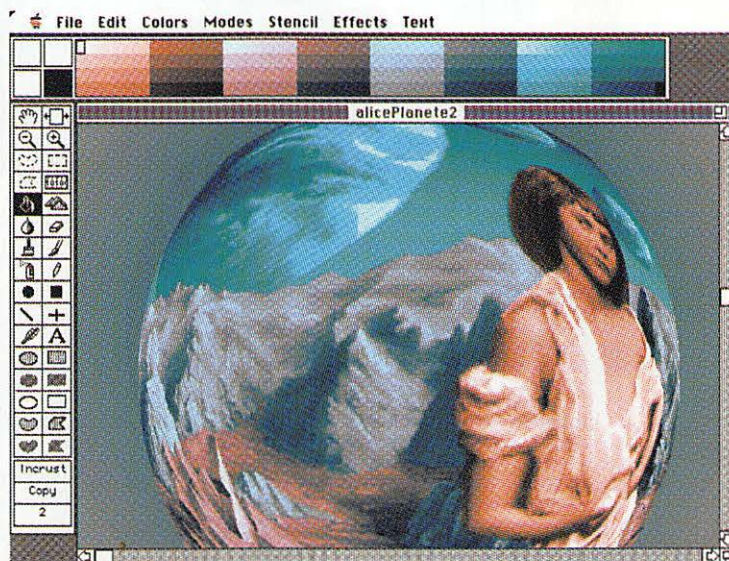
Presentation Software

Never have so few owed so much to so many. Sounds like a vintage wartime quotation, or what the venture capitalists must be saying about this category. What a battle. The leading Mac programs—Cricket Presents, Microsoft PowerPoint, Aldus's program (unnamed at press time), Symantec/

Living Videotext Division's More, and Manhattan Graphics' ReadySetShow—are all facing a host of new competitors from developers on the IBM PC side, including Management Graphics, Slidetek, MagiCorp, Strade, VBS, and Zenographics. There is also a stalking horse in this field: MacDraw II. MacDraw II boasts some new features, including a plotter driver you can select

tageous features. Of course by the time Aldus ships its nameless program, Presents will have new features too.

The presentation software market has heated up faster than any other Macintosh market. There are either too many companies competing for the Mac's installed base—or this is going to be one big market. (I think both are true.)



Aba's forthcoming color paint program, GraphistPaint II, lets you easily modify the palette and attach images to a shape, as on the sphere in this example.

from the Chooser, that make it an ideal tool for fast turnaround of color overhead presentations.

For now, Cricket Presents has a definite lead in the market. It has been shipping, it's a good product, the templates are useful, and the connection to the Auto-graphics slide-production centers works. PowerPoint 2.0 arrived in our office at press time, so I haven't tried it out yet, but it looks good at trade show demos. PowerPoint's requirement that its fully supported service bureau, Geniographics, rekey slide input at its slide centers will prove troublesome, however. Both More and Aldus's new product have efficient outlining tools to help create slides, along with other advan-

Image Processing

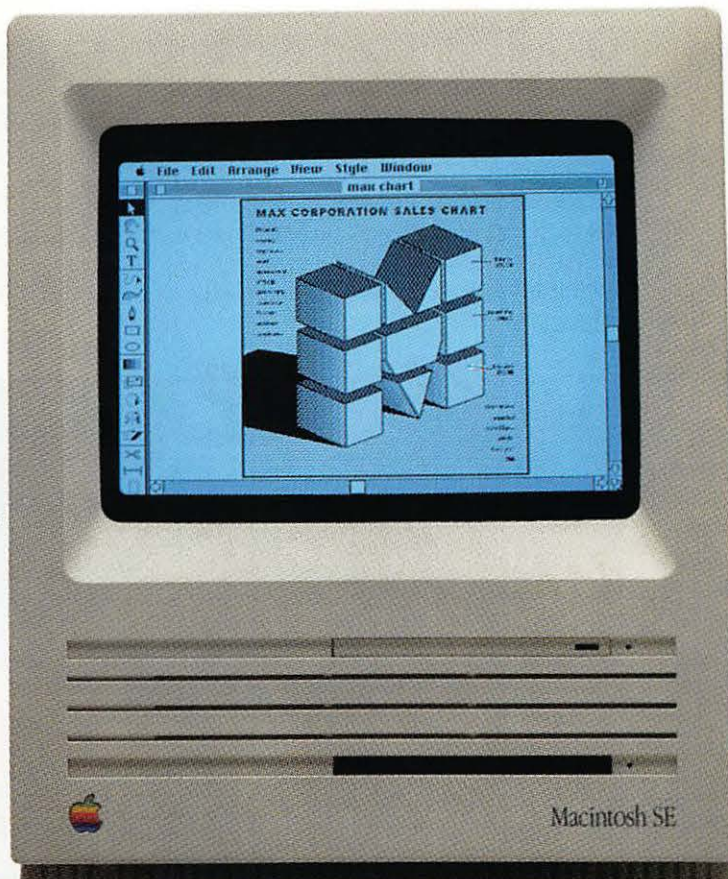
At long last Silicon Beach is shipping Digital Darkroom. Silicon Beach has grown so much that this product was long delayed, but it has some very interesting printing features, such as an algorithm that makes for high-quality printing on non-PostScript laser printers. Check it out. It complements rather than competes with ImageStudio. ImageStudio 2.0 has some very nice enhancements, such as the ability to manipulate gray scale in individual regions of an image. Definitely look at this one, too.

(continues)

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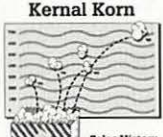
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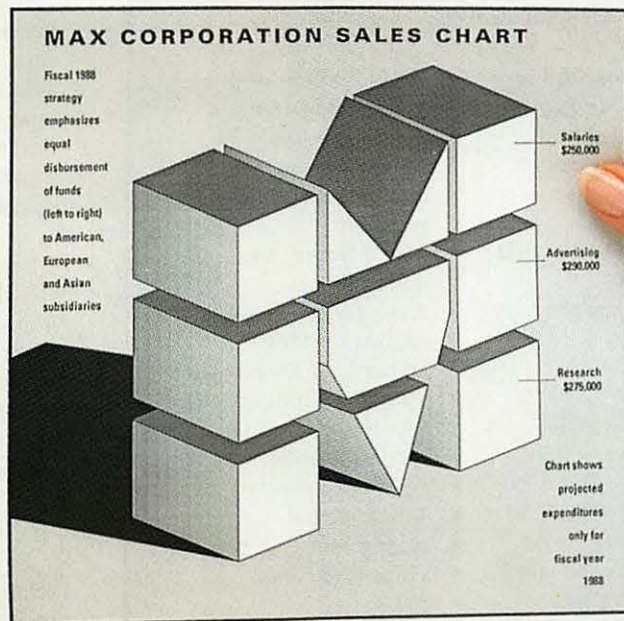
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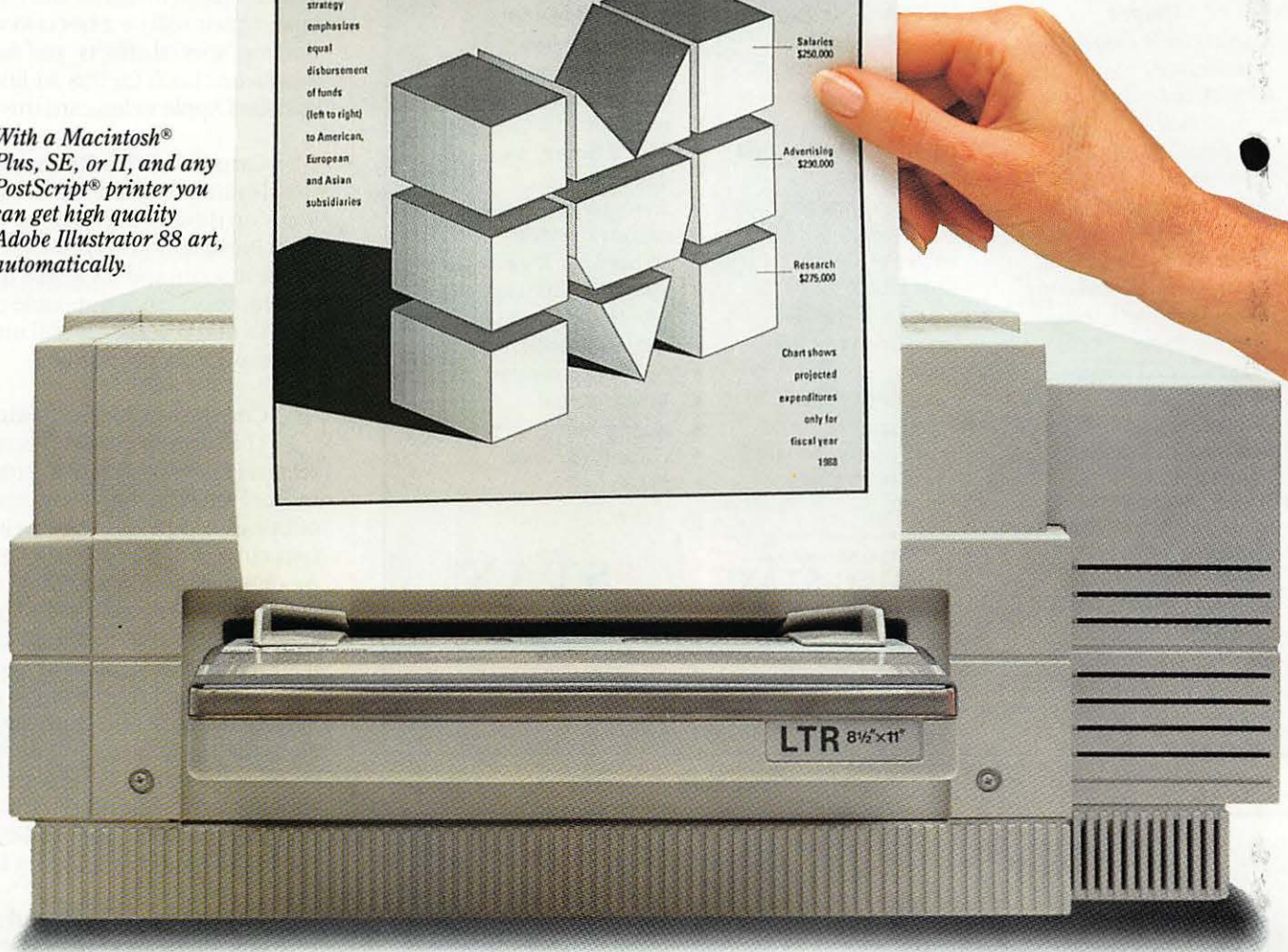
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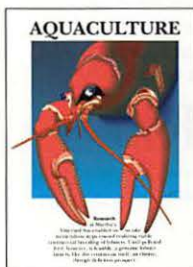
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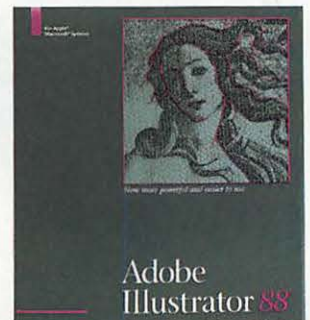
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Circle 179 on reader service card

Commentary/Jerry Borrell

Monitors

The news is in color. What with Apple having announced specifications for 24-bit QuickDraw late in the summer, both RasterOps and SuperMac are back at the drawing board working on 24-bit color cards. They'll be previewing boards in progress at the expo. Among the new 8-bit color players are E-Machines and Radius; both deserve a visit.

Video

And in related developments, Apple has announced NTSC video for its video card. We can now look forward to being able to record from the Mac onto videotape, which will be a boon to video production, special effects, and animation producers. Look for this addition to the standard Apple video card this fall.

Cameras/Film Recorders

Hmmm. Don't make any unsecured loans on these things. The new product from Presentation Technologies looks very good, though, and it's a sure thing. Lasergraphics also has a shippable camera. Mirus's film recorder is still under development, AWOL, at press time.

Computer-Aided Design

The big news in CAD comes from two relatively new companies. Paracomp, here in San Francisco, has two outstanding new offerings: ModelShop and Swivel. Swivel, in particular, will serve as a powerful design-modeling system. You'd use it to create complex 3-D objects for design or animation. In addition to being a facile modeler, it allows for fast shading of objects.

Gimeor, a French firm, is now selling Mac Architrion, a 3-D modeling product aimed at the architectural market in this country. Gimeor is implementing and should be showing a color rendering addition to its package. Sadly, Silicon Beach's Super 3D is still not shipping in color.

Communications and E-Mail

One of the most important changes in the Macintosh community is taking place in Berkeley, California, at Farallon Computing. The company, which recently merged with WOS Computing, is addressing a host of technology areas for the Mac: E-mail, remote and distributed processing on per-

(continues)



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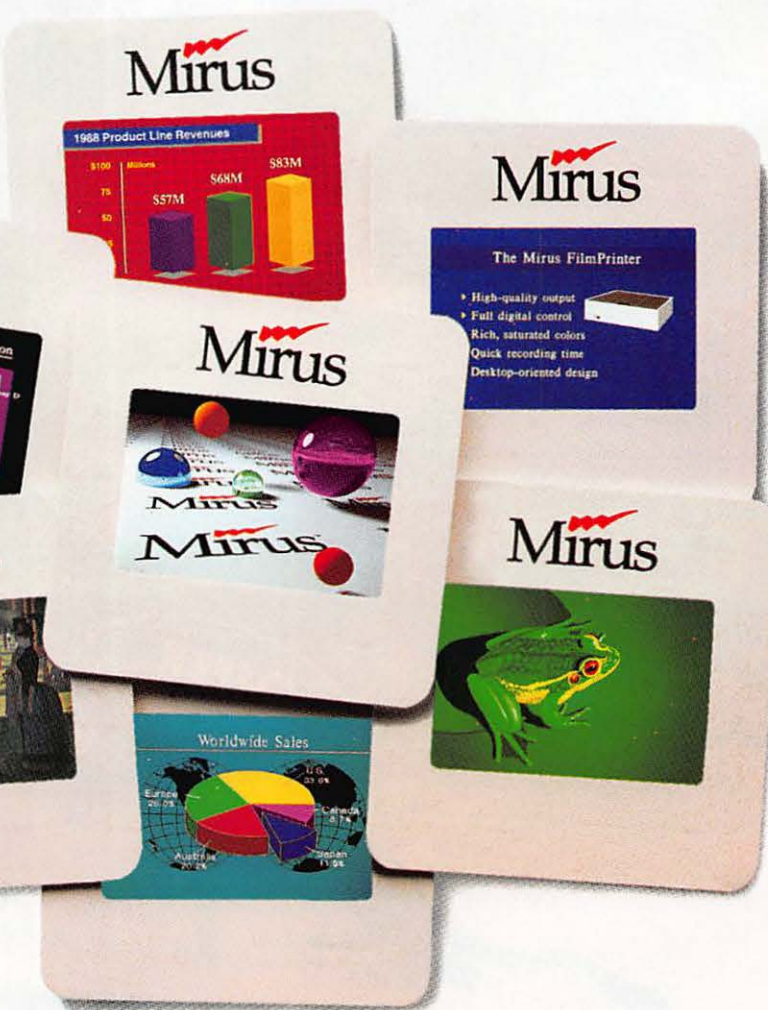
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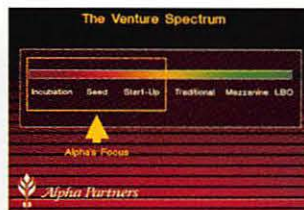
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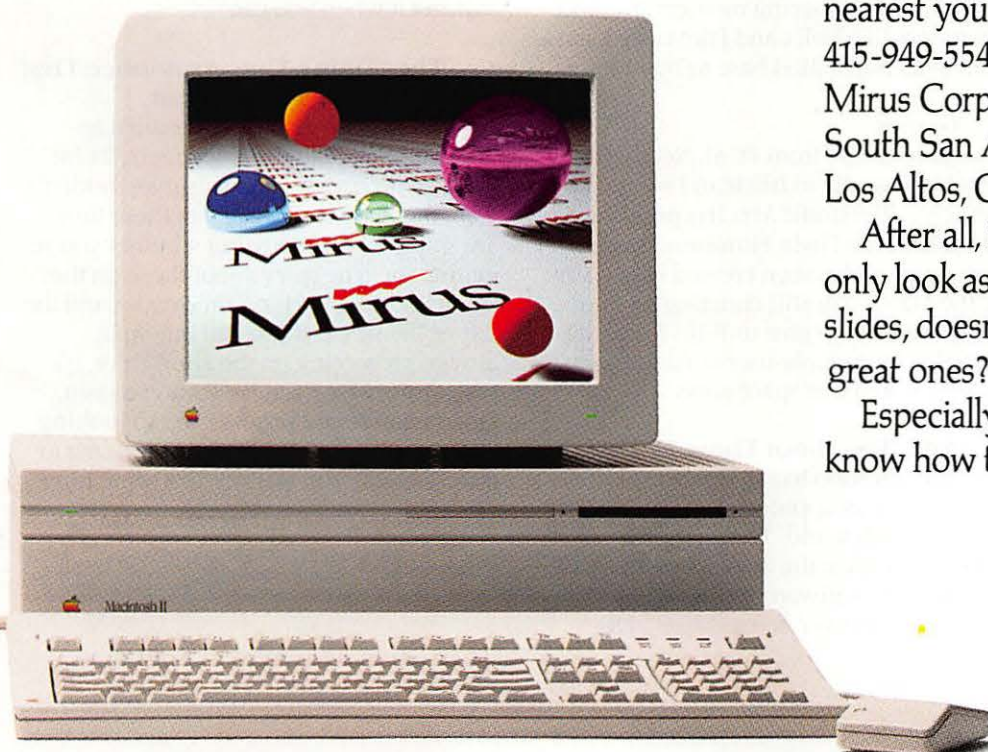
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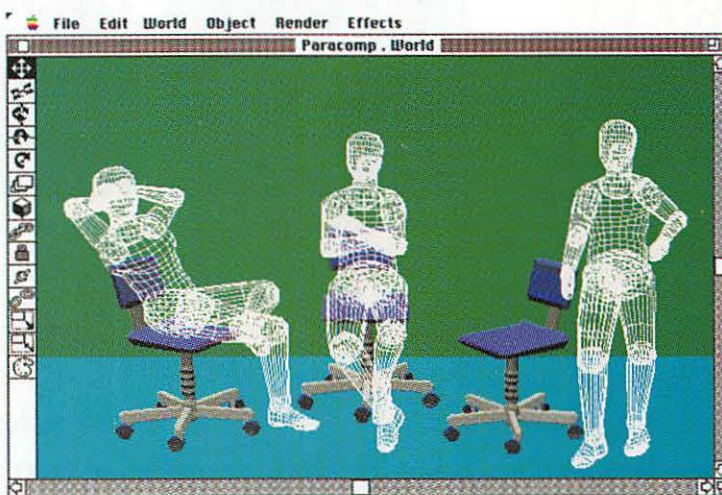


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Circle 278 on reader service card

Commentary/Jerry Borrell



One of several new offerings from Paracomp, Swivel, a 3-D modeling and animation program, lets you combine wire-frame models and solid shapes in the same image.

sonal computers, voice mail, sound, networking, and network analysis. I recommend planning to spend as much time as you can at Farallon's booth at the expo. The products coming out of this merger will be remarkable; Katmandu, a companion product to WOS's Timbaktu, will be the first of these.

Databases

It should come as no revelation that Acius has made great headway in database sales. In some ways both Guy Kawasaki and 4th Dimension are creatures of the media—examples of good products helped by good press (*InfoWorld* notwithstanding). But there is going to be quite a fight here. After a slow start, Ashton-Tate's dBase Mac is gathering momentum. And old-timers like Helix and FileMaker have a tremendous installed base to build upon.

Games

MacGolf 3.0 from PCAI. Need I say more? It was a hit in black and white; try it in color. Electronic Arts has published Chuck Yeager's Flight Simulator, the first color game we've seen created especially for the Mac II. I'm still counting on Spectrum HoloByte to give us F-16s for aerial dogfights (a multiple-user version too, please). Watch that space soon.

And How about Those Utilities?

The question to ask is whether the Norton Utilities approach can succeed in the Macintosh world. The answer is yes: just take a look at the Symantec Utilities package. The software includes Guardian (which can recover deleted files), HD

Tune-Up (defragments files), HD Partition (allows disk partitions), QuickCopy (speeds up floppy initialization), and lots more. Run, don't walk, to your local store to buy this if you own a hard drive.

System 6.0 Looks Good

We've had a look at System 6.0 Tools, and other than a few compatibility problems the new System software looks great (see *Mac Bulletin* in this issue for a complete list of incompatibilities). The MacroMaker feature has won raves from the editors here who have tried it. Go to your local authorized Apple dealer and buy this upgrade. Yes, 2 megabytes of memory is minimal to really make full use of it. I know there isn't any memory available—still, get it when you can.

The "Didn't They Announce That Last Year?" Department

Let's consider those perennial announcements: CD ROM, scanners, 24-bit video, tape backup, and facsimile modems. Well, the story is that a few of these things are shipping presently, but whether you're getting the true story about these on the show floor depends on the vendor and the day of the week. If you can buy what they're promoting on the show floor, it's real. Otherwise exercise your cynicism. One long-awaited product worth looking at is the new scanner from Apple. Long in development, the scanner has some innovative software features.

(continues)

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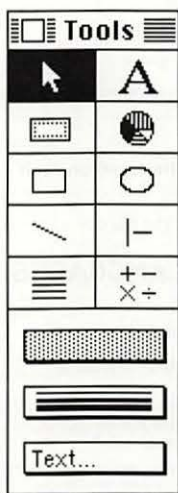
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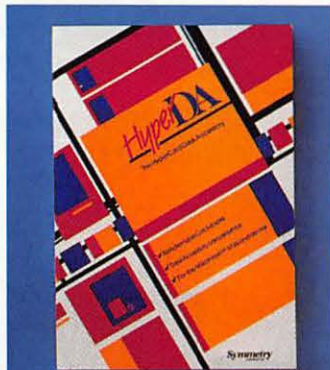
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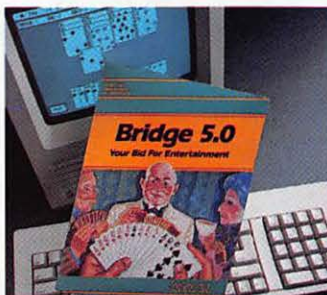
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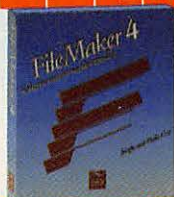
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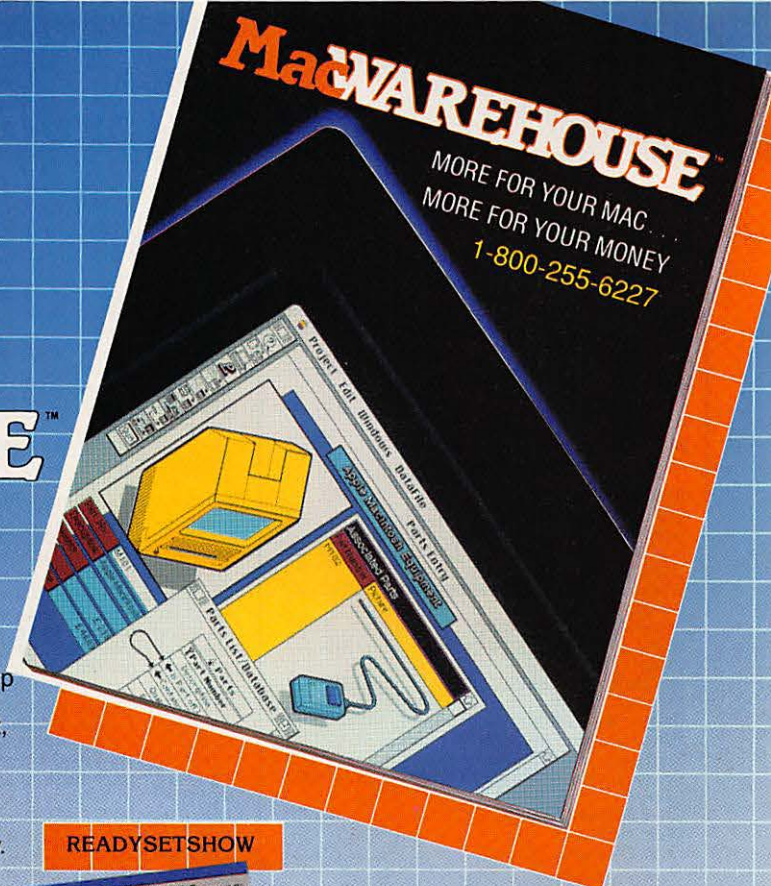


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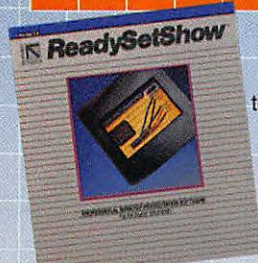
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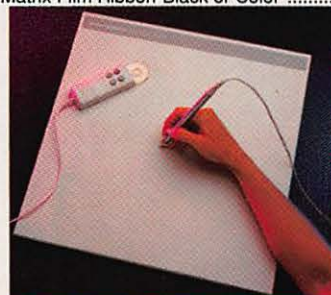
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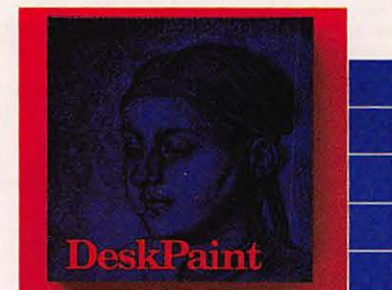
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Commentary/Jerry Borrell

Magazine of the Month Club

There will be a bevy of new publications premiering at the expo. I'll start with the one you're holding. Not that it's new, but with over 400 pages it is the largest issue we've ever produced. I'm also proud to note that we've made my statement of six months ago come true: we've had an average of over 260,000 readers per issue of *Macworld* since January of 1988.

Hayden will be showing an issue of the *Macintosh Business Review*, one of those perennial announcements. It is a free magazine to "business" users of the Macintosh—that is, those who know how to fill out a qualification form the "right" way. CMP, publisher of *Computer Reseller News* will be producing—dare I say it?—another weekly. This one aimed at the business of the computer business—resellers and others.

We'll probably see some more publications in the HyperCard area.

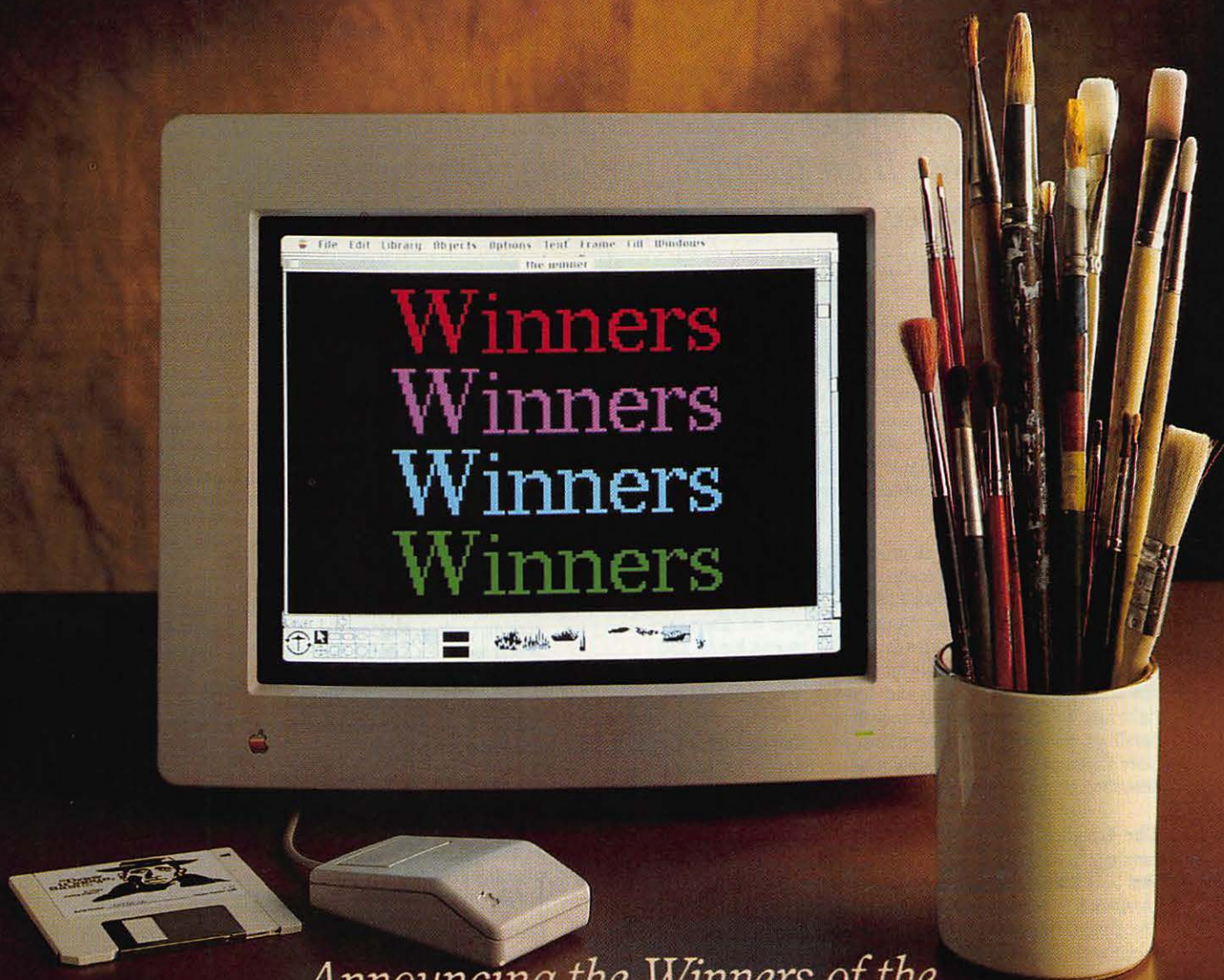
Changing of the Old Guard

Only the faces have been changed to protect the innocent. So many of the old faces that used to frequent the trade shows have gone—former Living Videotext founder Dave Winer, Forethought's former president Rob Campbell, and others. Some of the old faces are so busy that they're hard to find: Charlie Jackson of Silicon Beach, Heidi Roizen of T/Maker, Jim Rafferty of Cricket. And some, like John Warnock of Adobe, Paul Brainerd of Aldus, and Bill Gates of Microsoft, are usually ensconced in hotel suites where they hold court. Kudos to Apple's John Sculley, Del Yocam, and Jean-Louis Gassée for still wading through the masses and wandering around on the show floor to see what they have wrought.

Other faces have changed places. Andrew Singer, who has so aggressively promoted InBox and LightSpeed C during the past several years at Think Technologies, is now at Radius.

For a more detailed list of expo announcements, send a self-addressed envelope with 45 cents postage to me at *Macworld*, 501 Second St., San Francisco, CA 94107. □

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Announcing the Winners of the
“Draw it again, Sam...”
GRAPHIC ARTS CONTEST

The "Draw It again, Sam..." Contest Winners

It's just half a decade since the introduction of the 128K Macintosh and MacPaint, the software that sold so many Macintoshes.

If drawing by computer seemed irresistible then, the choices available for a Macintosh II are positively inspiring. Graphics products now offer performance on a Mac II that used to be available only on minicomputer workstations.

An inexpensive but excellent general purpose graphics program such as Aba Software's "Draw it again, Sam..." should not be overlooked in the high-end clamor. Aba staged a contest that would draw attention to this excellent, general purpose graphics program. The winning entries in the "Draw it again, Sam..." Graphic Arts Contest can be seen on these pages, along with comments from both winners and judges.

The prize-winning art was all produced on Macs using "Draw it again, Sam..." Version 2.0, a \$150 program (for Macintosh 512KE, Macintosh Plus, Macintosh SE and Macintosh II) that offers ten transparent layers for drawing or painting, unlimited libraries for storing images (up to 250 per library) and easy icon selection of library images. "Sam" has interchangeable painting and drawing (you can paint right into a draw area on the same layer) as well as text handling, color and spot separations, and other features of more expensive software. "Draw it again, Sam..." is fully described below.

The Graphic Arts Contest

Amateurs and professionals competed in the "Draw it again, Sam..." Graphic Arts Contest to win prizes for graphic excellence in commercial, technical, and fine art categories. The ground rules were simple: all artwork had to be produced with a registered copy of "Draw it again, Sam...", and contestants could only submit one entry per category. Their entries were reviewed by a panel of judges experienced in both computer graphics and the arts. The judges evaluated not only the art, but the methods used to create it.

Aba challenged contest entrants to take full advantage of the features of "Draw it again, Sam..." The incentives were tantalizing. Aba awarded the Grand Prize winner (for best overall work) an Apple Macintosh II computer with 40 MB hard disk, color monitor, and two megabytes of RAM — a total retail value of over \$10,000. The First Prize winners in each of the three categories and the Best Amateur Prize winner received an Apple Macintosh SE computer complete with 20 MB hard disk, a retail value of \$3,500. And finally, the twelve Honorable Mentions are acknowledged with the

publication of their work on these pages along with the other prize winners.

The Panel of Experts

Aba selected a panel of judges who had distinguished themselves in the fields of fine arts and computer graphics. The panel included among others: Philip Burton, Associate Professor in Graphic Design, Yale University. Professor Burton spent five years studying graphic arts in Switzerland. He currently teaches graduate students typography, using Macintosh computers to design fonts.

Michael Gosney, publisher and author. Mr. Gosney's forthcoming book is *Making Art with Macintosh II* (Scott, Foresman & Co.) Of all the judges, he is the most familiar with examples of art produced by popular Macintosh applications. In his role as publisher, Mr. Gosney showcases computer graphics in *Verbum, a Journal of Personal Computer Aesthetics*.

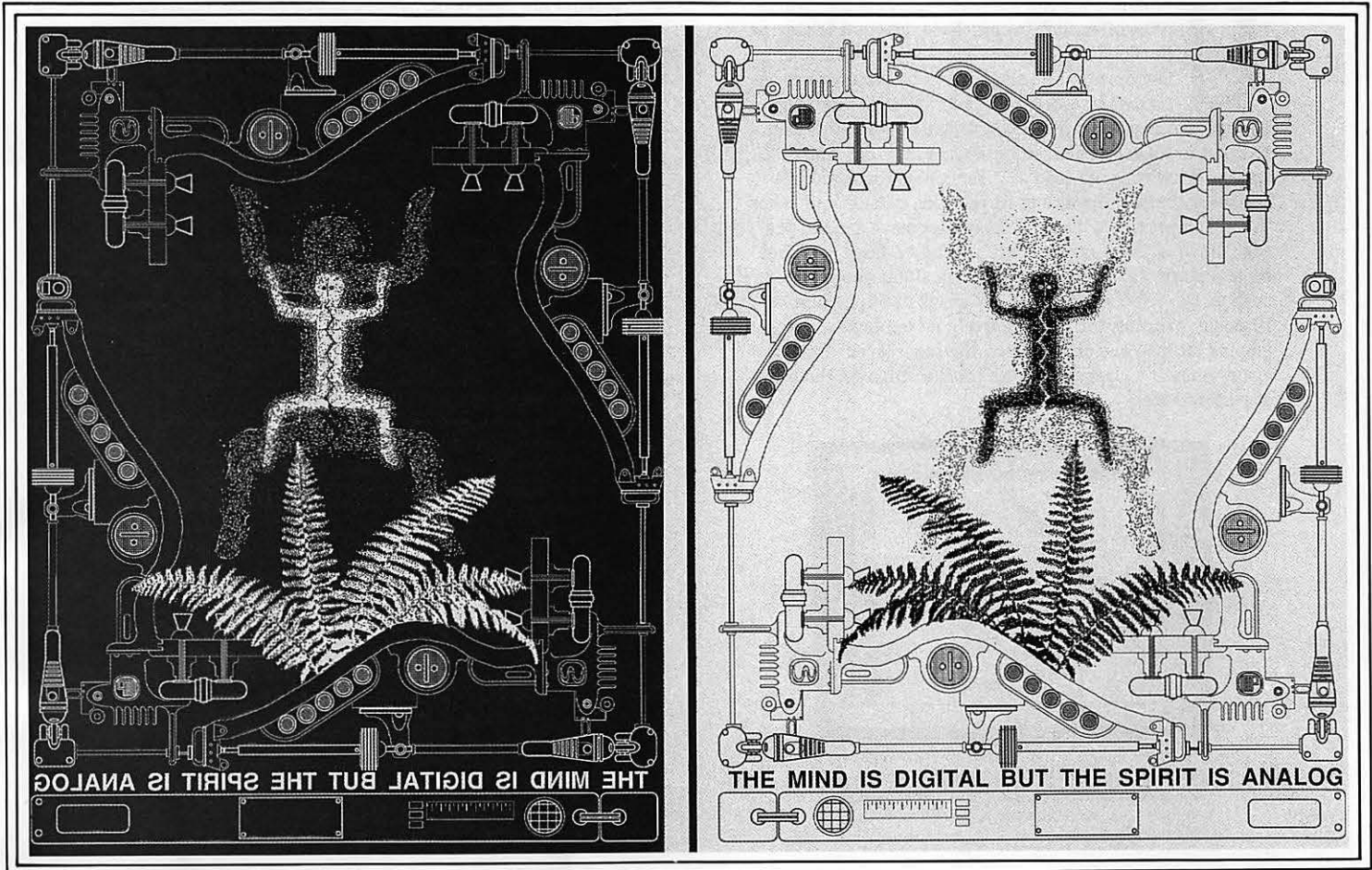
Marjorie Spiegelman, designer, Spiegelman & Mandel. Ms. Spiegelman has designed several computer magazines using desktop systems, including *Publish!* and *Macintosh Today*. As an accomplished design professional, she understands the time and experience required before a computer artist can fully apply design concepts acquired in other disciplines.

Mark Rosenthal, Curator of 20th Century Art, Philadelphia Museum of Art. Formerly the Curator of Collections at University Art Museum in Berkeley, Mr. Rosenthal has organized numerous exhibitions. He has contributed to the evaluation process his perspective on 20th century fine arts and graphics.

Each of the judges reviewed and scored the work separately. They examined the artwork on screen as well as on hard copy. The judges generally agreed that the submissions were surprisingly good. After tabulating the results, the judges debated among themselves the merits of the top ten pieces. Finally, they awarded prizes for the most appealing and interesting use of "Draw it again, Sam..." in each of the categories.

And The Winners Are . . .

WINNERS



Title: "The Mind is Digital but the Spirit is Analog." Artist: Michael Green, Doe Run, PA



Even though judges can be dazzled by the use of color, the judges awarded the Grand Prize for the best overall work to this black-and-white design. In the judges' opinion, the winning design effectively combined the program's draw/paint capabilities to produce an imaginative and provocative statement.

*Michael Green is the author and illustrator of *Zen and the Art of the Macintosh* (Running Press, 1986). Although Michael made a few initial drawings, it wasn't until he found what he wanted to create*

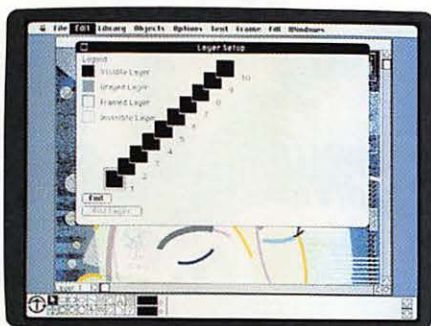
that the picture came together.

The title and the picture's cave-like drawing of a man remind us that the real roots of humanity reach far beyond technology.

Michael created the drawing on a Mac Plus. At first he turned the layers into a sketch pad to work out his ideas. In the later stages of the drawing, he altered the design by isolating certain elements on one layer and sending them to another. He found the zoom feature handy in aligning objects, and liked the effects he could produce with the customizable spray on the airbrush.

"Draw it Again, Sam . . ."

Unlike the general consumer marketplace, where price often dictates purchase, low-end pricing in the computer software market per se attracts few buyers. The emphasis is on performance. A successful entry-level program must offer competitive features and still be easy to learn, not to mention efficient in its use of disk space. Priced at \$150, Aba Software's "Draw it again, Sam . . ." Version 2.0 substantially enhances the performance of its previous version and keeps "Sam" competitive with much more expensive general purpose drawing programs. It offers simplicity, flexibility, and some features that are not available in similar programs, such as the \$395 MacDraw II or Canvas or SuperPaint. Drawing, painting and drafting freely on ten layers, overlapping bit-map and object art on the same layer, "Draw it again, Sam . . ." clearly deserves consideration on the basis of performance.



The Layers Setup dialog box lets you add layers and alter your current view of each layer. You can display each layer's contents (visible), hide them (invisible), see them as a solid background (gray), or in an outline (framed).

Layers, Libraries

"Draw it again, Sam . . ." gives you 10 layers on which to work — more than sufficient for most technical and fine art applications, and one that won't tax system requirements. You can move through the layers with ease. "Sam" lets you save one or more layers at a time, and print one or more layers at a time. There's a simple tool for multiple layer selection. To make your work easier, you can display layers in four modes: normal (complete), outline, invisible, and 20% gray screen (substitutes a patterned gray tint). Layers can also be used to create spot color separations and blended colors, increasing the number of color options well beyond the simple 8-color palette.

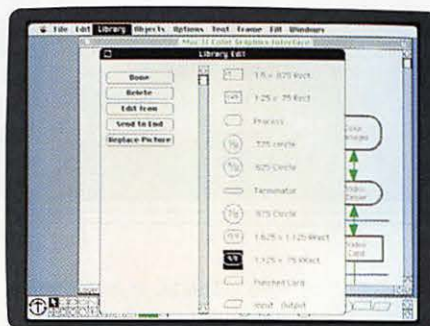
This program lets you create and edit as many libraries of frequently used symbols, logos, borders, frames and other objects as your disk can accommodate. Each library contains up to 250 different images. You can browse, pick and choose an image quickly from any library by menu, or by icon. With "Draw it again, Sam . . .", the library icon shows you a tiny representation of the actual stored image.

Dynamic Drawing Tools

"Draw it again, Sam . . ." has all the tools required for a serious drawing program. The menu includes rectangles, round corner rectangles, ellipses, horizontal and vertical

parallel line sets (with adjustable line counts), polygons, free forms and registration marks that assure accuracy in points, picas, inches, centimeters or engineering inches. You can choose the units of measurement, including grid sizes, and define the page size. X and Y grids are independent, so you can snap objects to either grid separately. By displaying mouse coordinates and using the adjustable rulers to place objects, you can exercise pixel-point control with ease. There are 20 levels of smoothing available for polygons. Arcs can be edited and reshaped. And unlike some complex Mac programs, all the tools and displays in "Draw it again, Sam . . ." closely follow Macintosh conventions, so there's no guessing about the way things work.

Object manipulation tools in "Draw it again, Sam . . ." rival those of MacDraw II. For example, the direction (arrow) keys can be used to move selected objects precisely one pixel in the arrow's direction. By double-clicking on an object, you see the location, fill, frame, color and line thickness in a dialog box and you may reset all of the object's attributes. You can stack objects on a single layer, send them to separate layers, overlap them in order of their creation, or rearrange the stacking order. "Draw it again, Sam . . ." recognizes that the mouse is the most important object manipulation tool, so the current mouse location, the last mouse click location, and the distance and angle from the last mouse click are displayed in the Mouse Window.



Libraries store up to 250 images created with draw, paint, and text tools. Each image is represented by a miniature replica in the library palette. The Libraries menu identifies each icon by name and image, lets you alter the icon without changing the artwork, as well as delete icons or rearrange them on the palette.

Smoothing Integrated Paint Tools

The big story with "Draw it again, Sam . . ." Version 2.0 is the carefree intermingling of bit-map painting with object-oriented graphics on the same level. Unlike a program such as Canvas, "Sam" allows you to switch modes, without having to first designate a region to be bit-mapped or having to stop and extend the region. With "Draw it again, Sam . . ." the flow from bit map to object is smooth and easy. You can paint directly on drawn objects with all the familiar painting tools: brush, pencil, paint bucket, spray can and eraser.

With "Draw it again, Sam . . ." you may have any number of paint objects. These are high-end features. So is the customizable spray can nozzle and eraser shapes, and the variable-intensity paint bucket that allows you to create subtle, muted fills.

WINNERS



Geoff Hall was an original 128K owner and currently consults with clients on how to apply high technology to the arts. Geoff had access to a Mac II with a 4-bit color card. This configuration posed an interesting set of design parameters. In addition to experimenting with the color palettes available to him, Geoff also played with various gray shades to create background effects. In working with the layer capabilities and transfer modes, Geoff even discovered a useful undocumented feature that allowed him to lock the position of objects, while leaving him free to change their attributes.

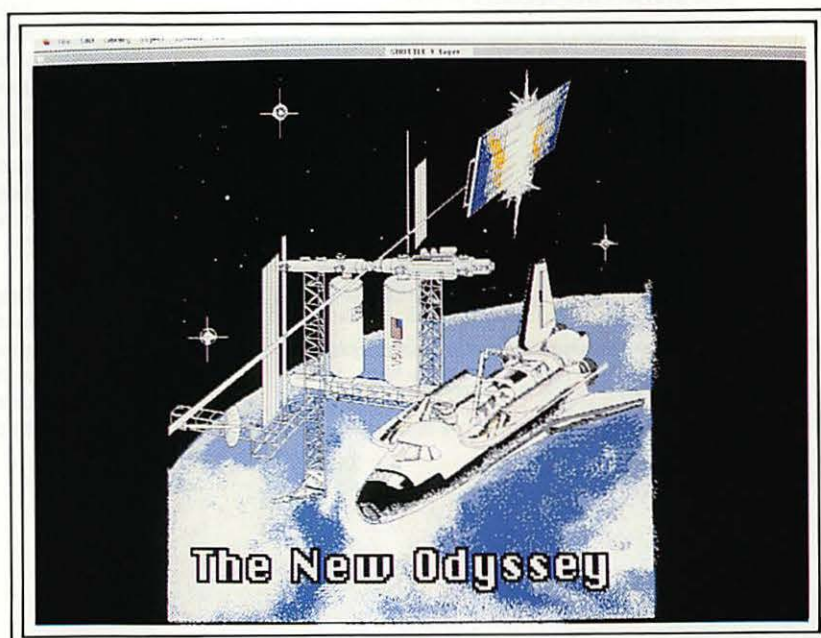


Title: "Explorer." Artist: Geoff Hall, Philadelphia, PA



About a month before the deadline, Darrell saw an ad for the "Draw it again, Sam . . ." Graphic Arts Contest on a bulletin board. A sophomore at San Jose State University, Darrell works part-time in the computer lab. He created his drawing on a Mac SE in the lab, working on it in spare moments. About a week before the contest deadline, his supervisor learned what Darrell was up to — and encouraged him to transfer the drawing to a Mac II and add color.

The concept for "The New Odyssey" came from a picture of the Space Shuttle Darrell saw in an issue of National Geographic. Darrell placed background objects, such as the Earth and solar reflections, on the lower layers. To make the background black, he used the polygon tool set for black. Working on the higher layers for the more intricate details, Darrell frequently used the Information Tool to identify and alter object data. He used the hairline option in designing the bars for the Space Shuttle.



Title: "The New Odyssey." Artist: Darrell Tang, Mipitas, CA

Lines, Frames, Fills, and Colors

Choose from a hairline to a fat line; lines come in seven thicknesses — one to five points, none, hairline and custom. You can select from 64 fill patterns available in black and white or color. "Draw it again, Sam..." also offers a choice of eight QuickDraw colors that any Macintosh can assign for output. However, by overlapping colors on the same or different layers, you can produce unlimited color blends, shades, and textures.

Any draw or paint object can be displayed in one of four transfer modes: Opaque, Clear, Invert, and Erase. Opaque is the normal mode that paints over everything; Clear lets something beneath show through; Invert makes solid areas blank, makes blank areas solid (and can create colors not in the standard QuickDraw palette) and changes what shows through; while Erase creates an effect similar to a photographic negative.

"Draw it again, Sam . . ." gives you the freedom to try out different effects by assigning separate or overlapping bit-mapped and drawn objects in various colors and modes. You also have the freedom to assign colors and modes before you draw, or add them later.

Printer technology is evolving rapidly, particularly in the area of color graphics. "Draw it again, Sam . . ." addresses the most popular color and laser printers and will be upgraded to keep up with important developments. (Aba provides free upgrades to registered owners.)



"Draw it again, Sam . . ." lets you freely mix draw and paint objects on the same layer. Choose from one of eight basic colors, or create blends of colors by overlapping objects in one of four different modes.

The Performance/Value Equation

The simplicity and ease of "Sam" recommends it not only to beginners, but to any person looking for an integrated draw/paint program. Professionals from architects to scientists who produce diagrams and layered drawings, and who do not have a need for CAD/CAM performance levels will discover that highly accurate technical drawings are easily done with "Sam." Desktop publishers will find that "Draw it again, Sam . . ." is simpler to learn and use than more expensive competitors, and more than sufficient for the jobs at hand.

Unlike many other software manufacturers who segment their product lines into various hardware and software applications, Aba is committed to serving the graphic requirements of the Macintosh community. Several new products from Aba reflect this singular commitment. "Sam Librarian" is a desk accessory that allows you to access libraries you've created in "Draw it again, Sam . . ." without having to quit from the program you're currently in. For example, if you're working in a desktop publishing program, you can open the "Sam Librarian" desk accessory, select the appropriate drawing from the library, then copy and paste it into your document. Aba's GraphistPaint I, a black-and-white paint program, and GraphistPaint Color, offer mathematical tools for stretching, distorting, and manipulating images. With the aid of a stencil layer, the program can combine portions of one image with another through area fill, color fill, or the painting tools.

Graphics are an inherent strength of the Macintosh. Aba's products give Mac owners the tools they need to produce good commercial, technical, and fine art. Of particular note in this era of maverick programming is Aba's insistence that their entry-level product respect the Mac interface and do things the way they're supposed to be done. Instinctively.

WINNERS



The Best Commercial Art Award went to Sonya Haferkorn for her skillful storyboard rendition and well-targeted application of "Draw it again, Sam ..."

As the Executive Creative Director for Four D Computer Graphics, a 3-D animation company, Sonya found that "Draw it again, Sam ..." provided an ideal environment for developing a sequence of animation. By using the layers, Sonya placed each object on its own level and manipulated it separately. She also used the layers to experiment with different versions of the objects. Sonya made extensive use of the program's ability to combine a set of textures and colors to create shades and blends, using the transparent overlays and different opacities. She plans to use "Draw it again, Sam ..." at work for her presentations. Instead of producing static diagrams with pointing arrows, Sonya can now display her concepts to a client on screen, altering, resizing, or replacing objects during the presentation.

Video Jukebox Storyboard

Concept for a 10 second promotional spot for a pay-TV music video show, to be rendered in 3-D computer graphics.

Designer: Sonya Haferkorn
Category: Commercial Art (Professional)
Date: May 1, 1988
Software: "Draw it Again, Sam ..." 2.01



1. Open on Video Jukebox logo. It is floating over a dance floor that swirls with patterned lights.



2. The logo zooms forward amidst a shower of brightly colored confetti.



3. A ladies' shoe enters the scene.



4. The other shoe joins it, and the pair begin dancing.



5. As the ladies' shoes move back, a pair of men's shoes dance into view.

Title: "Video Juke Box." Artist: Sonya Haferkorn, Long Island City, NY

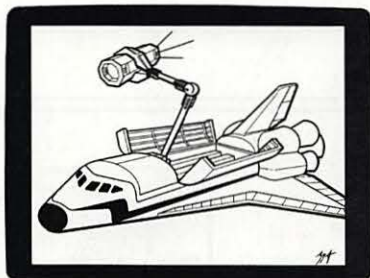


Title: "Bottles in Window." Artist: Matthew Seigel, Providence, RI

In selecting "Bottles in Window" for the Best Amateur Award, our judges thought the artist had given a traditional subject matter a fresh treatment by using the program's color capabilities and transfer modes.

The artist, Matthew Seigel, is a senior graphic designer for GTECH Corp., with a background of Computer Science courses at University of Maryland and Industrial Design at the Rhode Island School of Design. At work, Matthew prepares graphs, charts, and diagrams, but for the contest, Matthew decided to experiment with free-form concepts, and take advantage of the different textures he could obtain using the airbrush effects of "Draw it again, Sam ..." "Sam's" draw tools allowed him to continually change the colors, and rescale and rearrange the objects. In particular, Matthew appreciated the flexibility "Draw it again, Sam ..." afforded him to play with an image until he'd found the result he wanted.

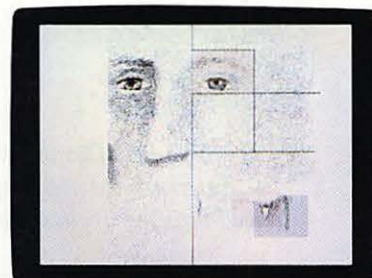
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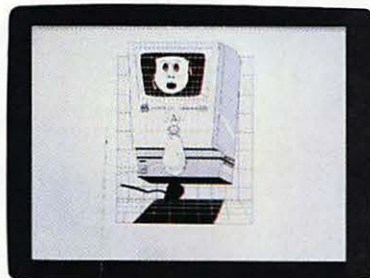
Title: "Shuttle."
Artist: Zbislav Aparowicz, Brookhaven, PA



Title: "Heroes' Garden."
Artist: Pat Bertha, Roseville, CA



Title: "Two Faces."
Artist: Louis A. Bosco, Jr., Pittsburgh, PA



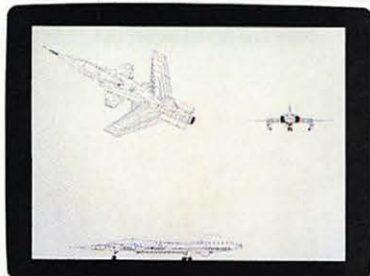
Title: "Mac Attack."
Artist: Martha Hernandez, El Paso, TX



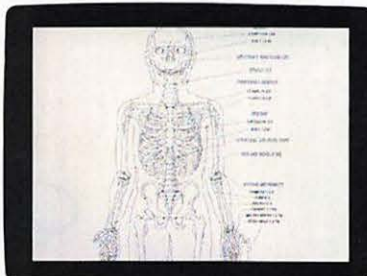
Title: "Rick's Dilemma."
Artist: Geoffrey Homan, New York, NY



Title: "Future Plans."
Artist: Heidi Lane, Port Orange, FL



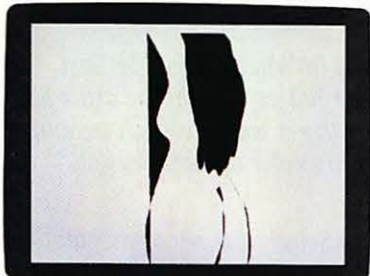
Title: "X-29."
Artist: Scott Murta, Brookhaven, PA



Title: "Skeletal Systems."
Artist: Bill Myers, Glenolden, PA



Title: "Midnight Music."
Artist: Carl Stone, Campbell, CA



Title: "Nude Back."
Artist: Ed Tyson, Wichita, KS



Title: "Rhinos."
Artist: Ed Urian, Pittsburgh, PA



Title: "Portrait of the Mind."
Artist: Rodney Warren, Silver Spring, MD

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Hey! Wanna Buy a Used Mac?

Like pork bellies and stock futures, the market for used Macintoshes is booming. Why?

In a nondescript office a block down the street from the flesh markets of Times Square, a different type of trading takes place. There, brokers cradling telephones deal in the used-computer market, marrying potential sellers of silicon to those wanting pre-owned machines. The primary currency of this company, Computer Brokerage Services, is Macintosh computers. The cofounders of the business consider the Macintosh a commodity: prices rise and fall almost daily, affected by factors as significant or arcane as those that determine the price of coffee beans or frozen orange juice. Instead of cold snaps and shortages of farm labor, these factors include the price of memory, the degree to which corporations look favorably upon the Macintosh, and above all, the cost of a new Macintosh at a discount store.

Welcome to the rapidly expanding world of used-Macintosh sales.

"It's exactly like the commodities market," says Stephen Simpson, who cofounded Computer Brokerage with fellow Mac freak Steve Doochin. "It goes up and down every hour. If someone calls in to sell 30 Mac Pluses and I have to get rid of them, for two hours the price of Mac Pluses goes down."

Steven Levy is a Macworld columnist and the author of The Unicorn's Secret: Murder in the Age of Aquarius, recently published by Prentice-Hall Press.



How much, you ask, are Mac Pluses these days? As I write this, in May 1988, Apple has recently cut its retail price for a Plus from \$2200 to \$1800, thus dropping the trading price of a used machine at Computer Brokerage from around \$1350 to somewhere between \$1000 and \$1100. This maintains a slim but significant advantage over the price one pays at a discount store like 47th Street Photo in New York City—around \$1300. (In your area, as in Boston,

where discount stores do not sell Macs at such low prices, the street price of a used Mac Plus may run a little higher, around \$1175, according to prices posted by the Boston Computer Exchange.) Computer Brokerage turns over used Pluses with little problem, and Simpson says that when

(continues)

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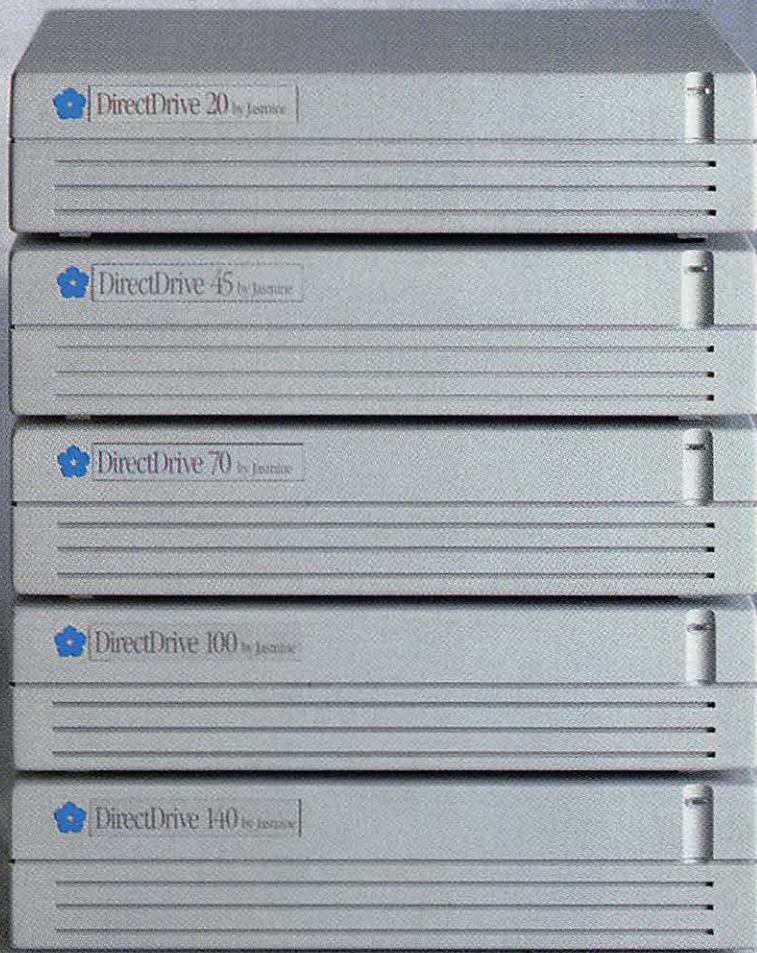
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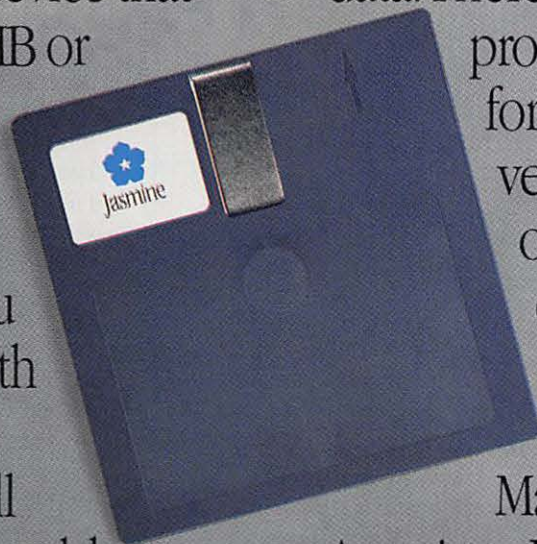
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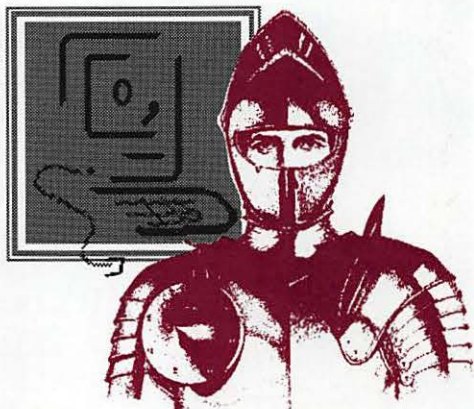
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Steven Levy

the "magic number" comes into play—anything less than four figures, no matter how many nines are among the digits—he can match an unlimited number of used Pluses to eager buyers.

Frisky Business

The Brokerage works this way. A caller offers a used Mac for sale, specifying the desired price. The broker taking the call, more often than not, provides some "education" at that point. The lesson: the price you paid three years ago for a Mac is several times what it is now worth, solely because the newer computers are more powerful and less costly. Once the seller accepts the facts of life, the broker accepts the listing and attempts to find a buyer. Often there is a list of potential buyers who have expressed a desire for a Mac at a certain price; others may call during the day. If not, the listing goes into the 4th Dimension database that Computer Brokerage uses. Some hard-to-sell items, like single-sided disk drives, might be on the list for months. But Macintoshes generally go fast. When buyer and seller are matched, Computer Brokerage holds the money in escrow until the buyer tests the equipment. Only then does it send the seller the money, less a 10 percent fee.

This seems less risky than the typical used-computer transaction, in which a classified ad brings buyer and seller together and the ground rules are as shaky as fault lines. On the West Coast the person-to-person exchange through classifieds remains the most popular method, while Computer Brokerage and other services, like MacHeaven in Washington, D.C., and the Boston Computer Exchange, look like the preferred way to put a Mac up for sale on the Atlantic Seaboard. Another alternative is Sun Remarketing, a Utah company that maintains an 800 line nationwide. Among Sun's sources for equipment is Apple itself, which sends Sun the Macs originally sent to journalists as test equipment. After refurbishing used machines, Sun resells them with 90-day warranties—unusual in the used-computer business. Sun also has possession of all the Lisa computers that Apple couldn't—and then wouldn't—sell. Sun has upgraded them to run the current crop of Mac software and tries to convince callers who want a Mac that these new-age Lisas will do the trick.

(continues)

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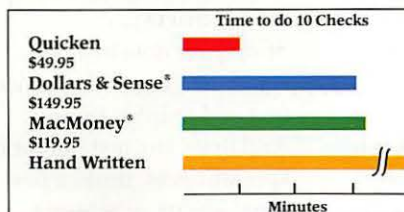
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Steven Levy

As Macs gain acceptance in the business world and their numbers proliferate, more and more used machines will enter the market. "I think it's unrealistic to suppose that after someone spends \$3000 for a system, they'll throw it in the garbage," says Bob Cook, president of Sun Remarketing. As a consequence, the used-Mac business, at least according to those in it, will explode.

I have a cynical streak; whenever I hear of some business exploding, I ask, "In whose face?" When it comes to the used-Mac phenomenon, though, there seems to be no obvious class of losers. Is this really a case where everybody wins?

Why Buy Used?

It strikes me as odd that the price of a used Mac is only slightly less than buying new. Usually when one purchases a used item—a car, a sofa, a boat, or a bridge—both the seller and the purchaser expect the price to be considerably lower than the amount required to buy a factory-fresh version of the product. Of course, in some cases it can be argued that things grow more valuable with age, either because they have collectors' value (baseball cards, coins from the Franklin Mint, cookie jars exhumed from Andy Warhol's warehouse) or because "they don't make 'em like they used to" (sixties Mustangs, Les Paul guitars, Shaker furniture). The antique trade has yet to create a demand for 1984-vintage Macs, and no one would argue that the pre-platinum early machines, with single-sided drives and less memory than Ed Meese at the Irangate hearings, are superior to the current versions of those machines. Also, although Macintoshes are by and large reliable computers, the longer they last, the higher the probability that repairs will be necessary; power supplies, keyboards, and on-off switches have proven to be mortal components. Why would anyone take a risk on a used machine when it's only \$200 more for a new one?

The simplest response: To save two hundred dollars. And indeed, the high—some say inflated—retail price of the Macintosh puts it out of the range of a large number of potential buyers who want Macs but have budgets that simply can't be stretched to the point at which Apple satisfies its voracious appetite for profit. Besides impoverished individuals, small corporations venture into the used-Mac market to buy in quantity (perhaps for networking). Other common used-Mac cus-

(continues)

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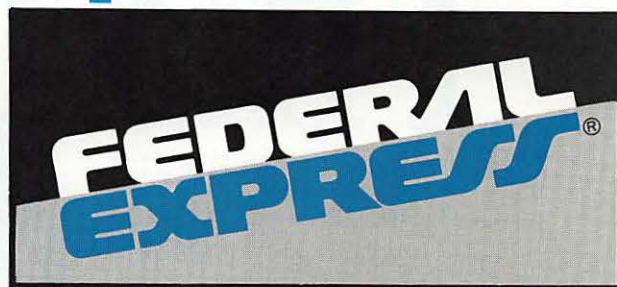
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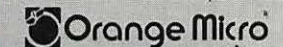
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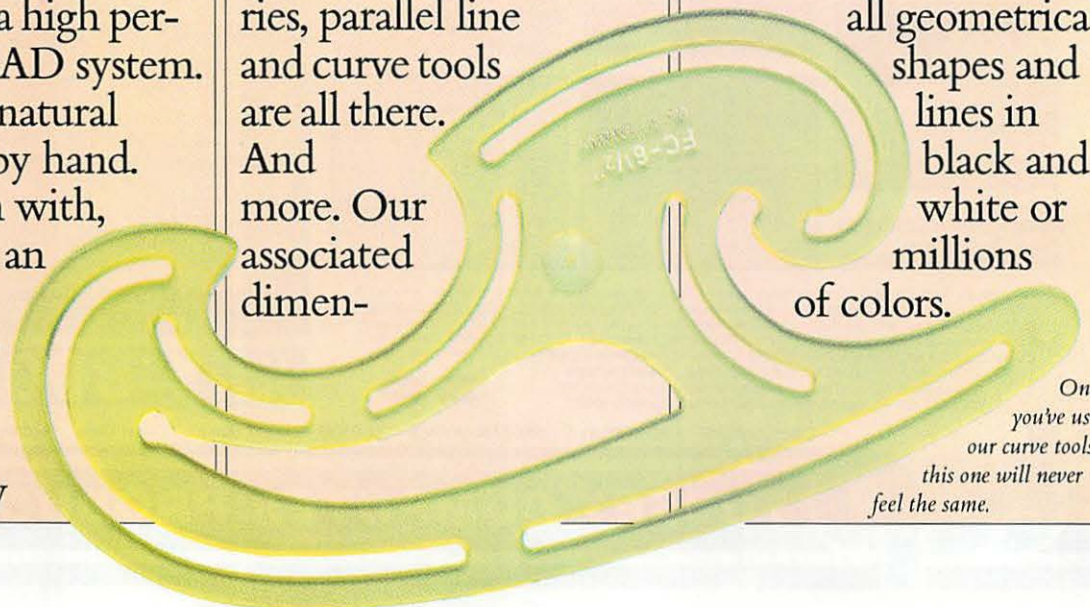
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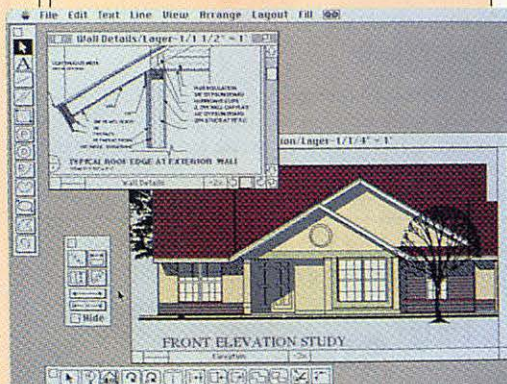


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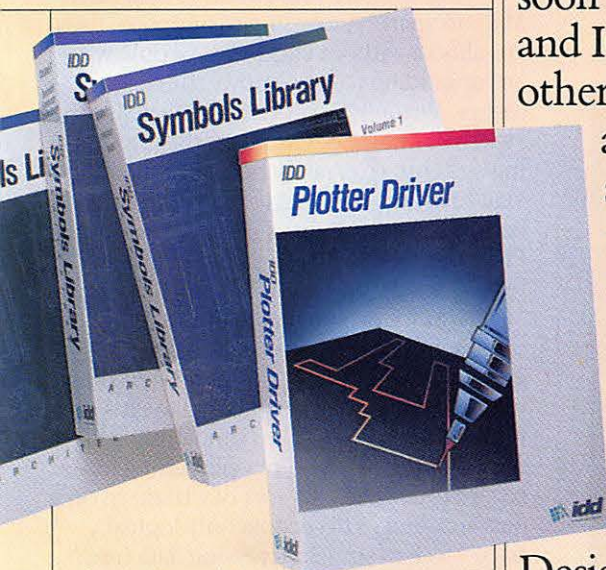


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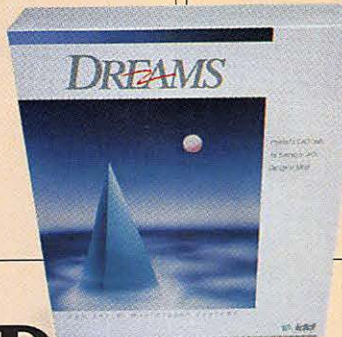


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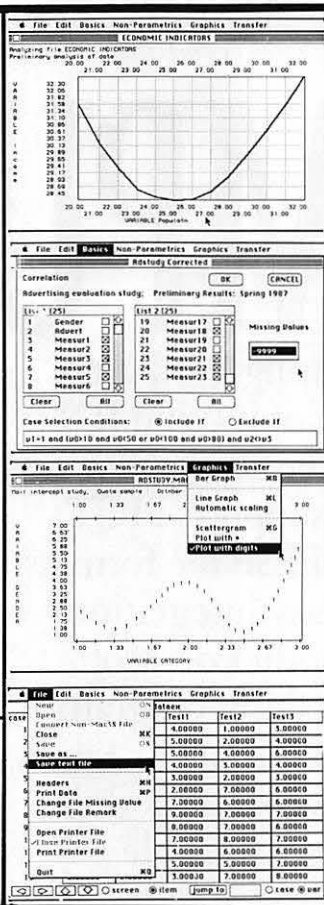
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Circle 227 on reader service card



Steven Levy

tomers are firms that want to thoroughly test-drive a Mac before taking the plunge on a major purchase.

When you consider the cost of an entire system, the savings often add up to much more than \$200. We all know that when machine, software, and peripherals are totalled up, the first-time buyer of a \$1400 Mac Plus will wind up leaving the store about \$2000 lighter. Hidden costs often don't exist in the secondhand-Mac mart. For instance, recent online listings of the Boston Computer Exchange included Macs for \$1100 and \$1300—prices that look attractive only when you notice that they come with ImageWriters or old 10-MB hard disks. In addition, sometimes users don't need (or think they don't need) all the power of a Mac Plus and willingly settle for older, less-powerful machines that cost hundreds less than newer models. Computer Brokerage sells many 128K Macs to students and parents of small children for under \$400. How can you go wrong buying a Mac for \$400?

Hard-Pressed to Sell

And who are these sellers, who have Macs to spare? According to Simpson, they are almost without exception people who are upgrading to more powerful Macintoshes. Virtually no one is selling a Mac to switch to MS-DOS, OS/2, or other operating systems. (Certainly no one is ditching a Mac in order to return to typewriters and ballpoint pens.) Users sell their Mac 512Ks, Pluses, and even SEs so they can take at least one step up—to a Plus, an SE, or a Mac II. Since Apple's fickle upgrade policy often makes it almost as expensive to upgrade as to buy a new computer—and no upgrade path exists at all to make Plus-or-lower Macintoshes fully compatible with the SE or the Mac II—people selling Macs regard the process as sort of a trade-in on a new machine. This seems only logical, once you ban some distressing data from your mind. I'm talking about the fact that someone who paid \$2500 for a Mac 512K three years ago will clear perhaps \$500 toward the purchase price of a new SE that then costs \$2000. The difference is, I guess, that the seller can now use MultiFinder, HyperCard, FullWrite Professional, and other memory hogs.

Of course, that seller had the option of spending \$1000 or so to upgrade the unenhanced Mac 512K to a virtual Mac Plus—but why spend so much on an old machine

(continues)

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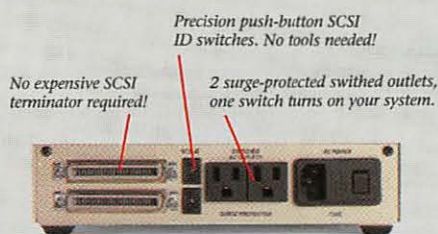
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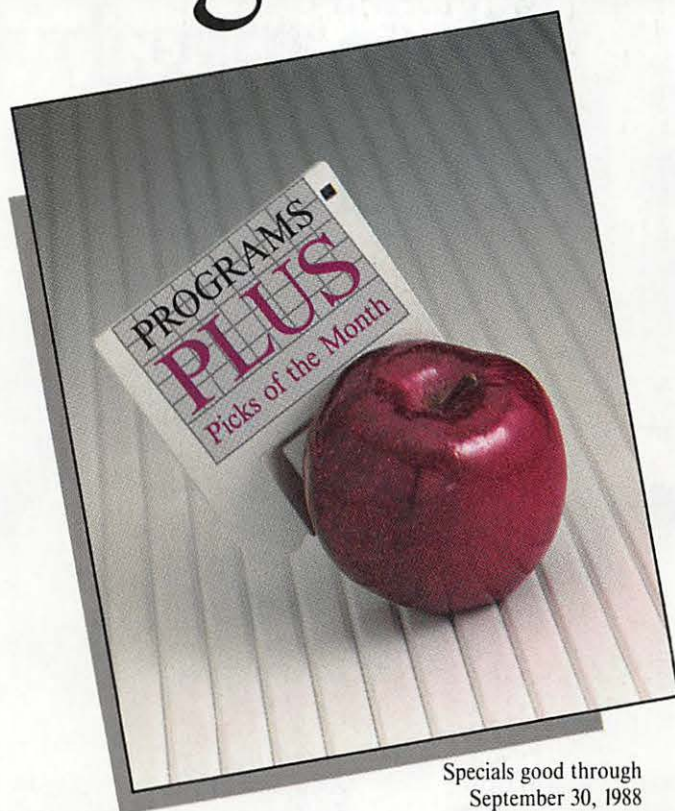
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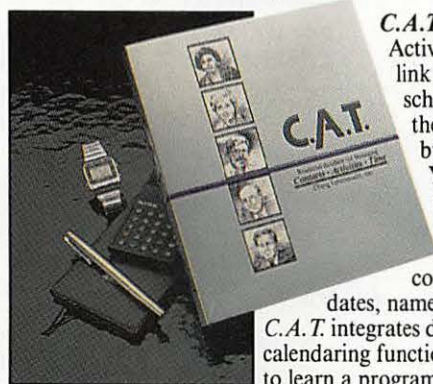
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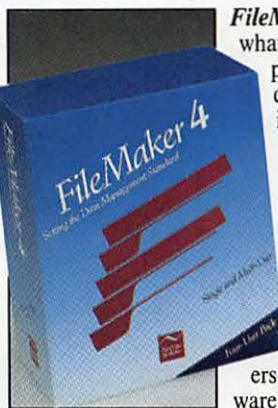
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Design Software/Electronic Arts		SuperMac Software SuperSpool 5.0	54.
DS Backup	49.	SuperLaserSpool 2.0	82.
Dove RamSnap	21.	Diskfit 1.4	54.
Emerald City Software		Sentinel 1.0	155.
LaserTalk	187.	Symantec	
Fifth Generation Systems		Symantec Utilities for Mac (S.U.M.)	59.
FastBack For The Macintosh	54.	Symantec/Turner Hall Publishing	
Suitecase or Power Station	37.	MacSQZ!	49.
Ideaform Disk Quick V2.10	25.	Williams & Macias Disk Finder	29.
Infosphere Liaison	129.	myDiskLabeler w/ Color	31.
LaserServe (LaserWriter Print Spooler)	62.	myDiskLabeler w/ LaserWriter Option	34.
Microlytics, Inc. GOfar	49.	Working Software, Inc.	
Microseeds Redux	65.	Findswell 2.0 (Document Finder)	36.

Communications Software

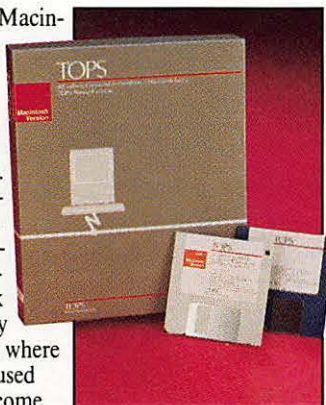
Compuserve		Freesoft Red Ryder V10.3	55.
Compuserve Starter Kit	24.	Hayes Smartcom II 3.0	88.
Grolier On Line Encyclopedia	32.	Palantir InTalk V3	119.
Compuserve Navigator	45.	Software Ventures	
DataViz MacLink Plus with Cable	145.	Microphone II (Includes Glue)	229.
Dow Jones Desktop Express	95.	Traveling Software LAP-LINK	85.

to Polish Up Your Mac...

TOPS for the Mac by TOPS, A Sun Microsystems Co.

TOPS for the Mac transforms any Macintosh with at least 512k of memory into a **TOPS** network station. The **TOPS** network allows you to share files not only with other Macintosh stations, but with IBM PC's, Sun Workstations, and other computers. Included with **TOPS** are useful programs for print spooling PostScript files, and converting file formats between many popular DOS and Macintosh applications. Sharing network resources and information is quickly becoming essential in environments where different computer types are being used together, and **TOPS** has quickly become the standard way to accomplish this quickly and easily.

TOPS for the Mac 119.



New Turbo Mouse by Kensington



Here is the best reason around to retire your mouse, the **New Turbo Mouse** from Kensington. Twice as fast as a regular mouse, while taking up half the space. When rolling the ball slowly, you can attain 200 CPI precision. Roll it quickly and you'll fly across even the largest "Big Screen". It uses half the space of the normal mouse, and since it doesn't move all over your desk, it's at home amidst a sea of papers as well as an empty desk. One of the mouse buttons operates like a standard mouse

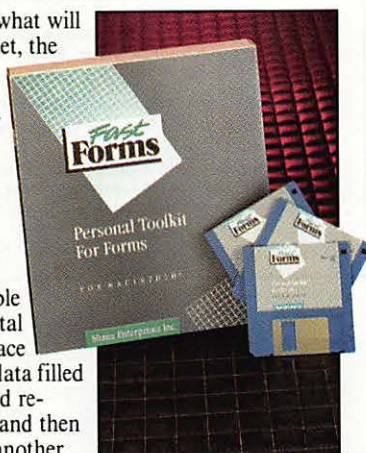
button, while the other is a "Click Lock". You can also program your mouse to perform one of six time saving functions when you click both of the buttons at once.

New Turbo Mouse 109.

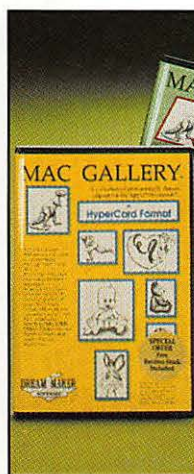
Fast Forms by Shana Enterprises

Fast Forms is the first entry into what will be an extremely competitive market, the production of high quality forms right on your Mac. And, after reviewing the package, we're ready to call **Fast Forms** the winner, hands down. All the features we were hoping for were included, such as standard line, circle, box and text editing. But **Fast Forms** goes further, letting you choose from grey screens, hairlines, variable type sizes and customized horizontal and vertical grids. You can also place data entry fields where you want data filled in, and **Fast Forms** will format and recalculate the fields automatically, and then allow you to transfer the data to another program, or print directly to your dot matrix or laser printer.

Fast Forms 79.



MacGallery by Dream Maker Software



MacGallery is a collection of over 400 pieces of hand drawn artwork created by a team of talented artists. The first volume of **MacGallery** covers a wide range of topics including holidays, sports, food, special occasions, nature, fantasy, religion, phrases, teddy bears, mortise cuts, borders, and more. **MacGallery** is available in either HyperCard Stack or MacPaint versions. The MacPaint version works with any PAINT program and comes packaged on two 400K disks. The HyperCard version comes on two 800K disks, and can be used with HyperCard or Hyper DA. Both versions of **MacGallery** are currently being shipped with over 50 pieces of bonus Border Art, and are compatible with the LaserWriter and ImageWriter series of printers.

MacGallery 28.

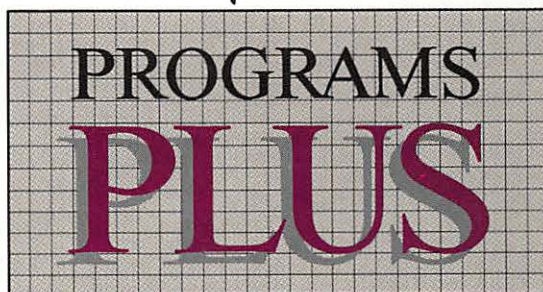
ReadySetShow by Manhattan Graphics

Presentation business graphics have just come of age with the recent release of **ReadySetShow**. Whether you're selling an idea or a product to management or customers, this program will make what you have to say crystal clear in a beautiful way. **ReadySetShow** includes fully integrated charts and graphs, text handling, and several essential time savers such as glossaries, style sheets and spell checking. Use the extensive library of design templates, wide file import capability and broad choice of output devices to create advanced, professional looking slides and transparencies. **ReadySetShow**, the presentation graphics package of the future, available today!!!

ReadySetShow 289.



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Disk Drives/Hard Disks/Upgrades

AST Research		MacSnap Plus 2 (MacPlus to 2MB Non Expandable)	315.
Mac286 Co-Processor (Mac II)	Call	MacSnap 2SE	299.
Central Point		1024 Option (1MB Accelerator or MacII Memory Exp.)	195.
Central Point 800K External Drive	185.	Math Kit (Math Co-processor Chip Set)	225.
CMS		SCSI Interface/Port	85.
Compact Series SC30 (Mac+/SE/II)	649.	MacSnap Toolkit (torx driver, opener & grounding set)	15.
Compact Series SC45 (Mac+/SE/II)	859.	Everex Emac 20D (20Mg Hard Disk)	520.
SD Series MacStack SD20 (Mac+/SE/II)	569.	Emac 20 Deluxe	585.
SD Series MacStack SD30 (Mac+/SE/II)	615.	MacMemory, Inc. Turbo SE (16 Mhz 68000 Accelerator for the Mac SE)	369.
SD Series MacStack SD60 (Mac+/SE/II)	849.	Personal Computer Peripherals	
PRO-SE Series 30SE/1 or 30SE/R	535.	Beige or Platinum Color, Optional Built-In Modems Available.	
PRO-SE Series 45SE/1 or 45SE/R	735.	MacBottom HD-21	749.
PRO-II Series 60-II/1	735.	(20+MB SCSI Hard Disk)	
PRO-II Series 100-II/1	1169.	MacBottom HD-32	879.
60MB Tape Backup (Mac+/SE/II)	785.	(32MB SCSI Hard Disk)	
Cutting Edge		MacBottom HD-45	1139.
Cutting Edge 800K Drive		(45MB SCSI Hard Disk)	
(Beige or Plat.)	175.	MacBottom HD-70 (70MB SCSI Hard Disk) Plat only	1395.
Cutting Edge Wedge XL 30		MacBottom 1HD-144 (Mac II)	2195.
Plus SCSI Hard Drive	629.	WSI (connects HD-20 SCSI)	295.
Cutting Edge Wedge XL 45		Rodime Rodime 20 Plus Ext.	629.
Plus SCSI Hard Drive	829.	or 20I Plus Int.	939.
Dove Computer Corporation		Rodime 45 Plus (Ext. 45MB SCSI)	829.
68020 Accelerator Boards for Mac SE		Rodime 450RX (Int. 45MB Mac SE/II)	1039.
MSE 1 (16 Mhz)	585.	Rodime 60 Plus (Ext. 60MB SCSI)	1169.
MSE 2 (16 Mhz w/1MB)	779.	Rodime 100 Plus (Ext. 100MB SCSI)	1319.
MSE 3 (16 Mhz w/Math Co-processor)	779.	Rodime 140 Plus (Ext. 140MB SCSI)	1045.
MSE 4 (16 Mhz w/1MB and Math Co-processor)	975.	Rodime 1000 RX (Int. 100MB MacII)	1669.
MacSnap 524 (512K to 1MB)	215.	Rodime 1400 RX (Int. 144MB MacII)	
MacSnap 524E (512E to 1MB)	189.		
MacSnap 524S (512E to 1MB w/SCSI)	250.		
MacSnap 548 (512K to 2MB)	359.		
MacSnap 548E (512E to 2MB)	425.		
MacSnap 548S (512E to 2MB w/SCSI)	489.		

Printers & Digitizers

AST Research TurboLaser P/S	3559.	Seikosha SPI000 (Imagewriter Comp.)	229.
TurboScan (Sheetfeed model)	1199.	Summagraphics MacTablet 12x12 size	379.
TurboScan (Flatbed model)	1329.	Bit Pad Plus (MacSE & MacII)	335.
Koala Technologies Corp.		ThunderWare ThunderScan V4.0 with Power Port (Mac 512K, 512K Enhanced, MacPlus, and Macintosh SE)	199.
MacVision 2.0 (Digitizer)	225.	Mac II Power Accessory	42.
Kurta IS ADB Tablet	259.		
Cordless 4 Button Cursor	99.		

Accessories

Abaton ProPoint (ADB TurboMouse for Mac SE & Mac II)	117.	Universal Copy Stand	22.
Asher Engineering Turbo Trackball (Mac & Mac+ or Mac SE & Mac II)	69.	Apple Security Kit	34.
Bech-Tech		Antiglare Polarizing Filter	33.
Fanny Mac (Beige or Platinum)	65.	Printer Muffler Stand (80 & 132)	21.
Curtis Manufacturing		Printer Muffler 80	43.
Emerald-Surge Suppressor-SP-2	36.	Printer Muffler 132	58.
Ruby-Surge Suppressor-SPF-2	55.	Masterpiece 400	64.
Cutting Edge Cutting Edge EADB-105 (Mac SE & Mac II)	135.	System Saver Mac (Beige or Platinum)	34.
DataDesk MAC-101 Keyboard/Beige (128k/512k & MacPlus)	139.	Super Base	64.
MAC-101 ADB Keyboard/Platinum (Mac SE & Mac II)	139.	System Saver SE	62.
Ergotron Mouse Cleaner 360°	15.	Masterpiece Mac II	119.
MacTilt or MacTilt SE (Platinum Color)	68.	New Turbo Mouse (Reg. or ADB)	Special 109.
Farallon MacRecorder Sound System (Mac SE or Mac II)	145.	Mouse Systems A+ Mouse (MacPlus)	65.
I/O Design		A+ ADB Mouse (Mac SE/Mac II)	85.
Mac Luggage in Navy or Platinum Gray		Moustrak MousePad 7"x9" Size	8.
Macinware Plus Carrying Case	69.	MousePad 9"x11" Size	9.
Macinware SE Carrying Case	79.	Orange Micro Grappler C/Mac/GS (Parallel Interface for the Mac)	84.
Imageware II Carrying Case	49.	Grappler L/Q (Parallel Interface for 24 Pin & Laser Printers)	98.
Kalmar Designs		Ribbons	
Teakwood Roll-Top Disk Cases:		Available in Black, Blue, Brown, Green, Orange, Purple, Red, Yellow, Silver & Gold	
Micro Cabinet (holds 45 disks)	14.	ImageWriter Ribbon	4.
Double Micro Cabinet (holds 90 disks)	20.	ImageWriter Black 6-pack	20.
Triple Micro Cabinet (holds 135 disks)	27.	ImageWriter Rainbow Pack (6 Colors)	20.
Kensington External Disk Drive Cover	8.	ImageWriter II-Four Color Ribbon	9.
Extra Long ADB Keyboard Cable	25.	Silicon Comforts MacChimney (Very Effective Cardboard Laminated Convection Cooling Device)	16.
Macintosh II Stand	20.	Smith & Bellows	
Macintosh II Monitor Cable Extension	33.	Mahogany Disk Case (holds 96)	30.
Mouse Pocket (Reg. or ADB)	8.	Sopris Softworks	
Mouseway (Mousepad)	8.	High Trek Carry Cases - Platinum Gray, Navy	
ImageWriter or ImageWriter II Cover	9.	Imagewriter II Case	49.
Macintosh Plus/SE Dust Cover	9.	Macintosh Plus, SE w/Standard Kybd	59.
Macintosh SE w/extended Kybd Cover	9.	Macintosh SE & Extended Kybd Case	69.
Mouse Cleaning Kit w/Pocket	17.	Targus (Canada)	
Disk Drive Cleaning Kit	20.	Imagewriter II Carry Case Blk.	49.
Tilt/Swivel	22.	Macintosh Plus Carry Case Blk.	59.

Blank Media

Single Sided 3 1/2" Diskettes		Centech 3 1/2" DS/DD Color Disks (10)	19.
Bulk (Sony) 3 1/2" SS/DD Disks (10)	12.	Sony 3 1/2" DS/DD Disks (box of 10)	18.
Sony 3 1/2" SS/DD Disks (box of 10)	13.	Fuji 3 1/2" DS/DD Disks (box of 10)	19.
Double Sided 3 1/2" Diskettes		Maxell 3 1/2" DS/DD Disks (box of 10)	20.
BASF 3 1/2" DS/DD Disks (box of 5)	9.	Verbatim 3 1/2" DS/DD Disks (box of 10)	19.
Bulk (Sony) 3 1/2" DS/DD (10)	17.	3M 3 1/2" DS/DD Disks (box of 10)	20.

Modems

Anchor Automation		Novation	
MacPac 2400E w/software & cable	179.	Novation Parrot 1200	109.
AST		Practical Peripherals	
AST-2x2400 (MacPlus/SE/II)	625.	Practical Modem I200SA	109.
Epic		Practical Modem 2400SA	189.
Epic 2400 Int. SE	249.	MacCompack (2400SA w/Microphone & Cable)	249.
(Hayes Compatible)		Prometheus	
Epic 2400 Int. Mac II	249.	Promodem 2400M Ext. (Software & Cable)	199.
(Hayes Compatible)		Promodem 1200 (Hayes Compatible)	239.
Epic 2400 Plus Ext	155.	Promodem 2400 (Hayes Compatible)	309.
(Hayes Compatible)		Supra Corporation	
Everex		Supra Modem 2400	149.
Emac 2400 Baud	225.	U.S. Robotics	
Hayes Microcomputing		Courier 1200 (Hayes Compatible)	199.
Smartmodem 1200	299.	Courier 2400 (Hayes Compatible)	349.
Smartmodem 2400	449.	Courier 2400E (Hayes Compatible)	379.
Migent		Courier HST 9600 (Hayes Compatible)	689.
Migent Pocket Modem (ext. 300/1200 Baud)	115.		

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Reports for Hypercard	59.	Microsoft Microsoft File	119.
Actius 4th Dimension	559.	Nantucket Software	
4D Runtime	245.	McMax (dBase III Compatible)	178.
Apple Computer HyperCard	44.	Nashoba Systems FileMaker 4	<i>Special</i> 179.
Ashton Tate dBASE Mac 1.0	295.	Nordic HyperCONTROL	42.
Blythe Software Omnis 3 Plus/Express	275.	Odesta Double Helix II	339.
Borland Reflex Plus	165.	GeoQuery	275.
Duesoft, Inc. Applications & Routines for 4th Dimension Vol. I	86.	ProVUE Development OverVUE 2.1E	149.
Fox Software Fox Base Plus	214.	Software Discoveries RecordHolderPlus	45.
		Telegraphics Hypertutor	30.

Business Software

Abacus StatView II (Mac+, SE, II w/68020 & 68881)	369.	Mainstay Think 'n Time	61.
Access Trapeze 2.1	185.	Mac Flow 2.0 or Mac Schedule	115.
Ashton Tate Full Impact	319.	Capture	38.
Borland Eureka! The Solver	129.	Micro Planning Software	
BrainPower StatView 512 Plus	175.	Micro Planner 6.0	349.
Math View Professional	145.	Microsoft Microsoft Excel 1.5	249.
Bravo Technologies MacCalc	79.	Microsoft Works 1.1 with Spellswell	185.
Chang Laboratories		Microsoft Multiplan 1.1I	119.
C.A.T. Contacts*Activities*Time	<i>Special</i> 229.	Micro Systems Software Analyze!	99.
Clarix MacProject II 2.0	395.	Owl International Guide 2.0	119.
Deneba Software Xtra 2.0	109.	Guide Envelope System	99.
Legisoft/Nolo Press WillMaker 3.0	35.	Satori Software Bulk Mailer 3.2	79.
Lotus Jazz 1A	189.	Bulk Mailer Plus	195.
Lundeen & Associates		Shana Enterprises Fast Forms	<i>Special</i> 79.
WorksPlus Commands	60.	Synex Mac Envelope	19.
MacroPac International		Mac Invoice	32.
101 Macros For Excel	44.	Systat Systat 3.1 (Specify Mac 512k, MacPlus, or Mac II)	459.

Word Processors & Desktop Publishing

Access Mind Write 2.0	129.	Microsoft Microsoft Word 3.02	249.
Mind Write Express	159.	Microsoft Write 1.0	113.
Allan Bonadio Associates		Posterart International, Inc. Laser FX	115.
Expressionist 2.0	84.	Quark, Inc. QuarkXPress V2.0	Call
Aldus Corporation PageMaker 3.0	475.	Symantec More 1.1C (Color Version)	175.
Ashton Tate FullWrite Professional	275.	Symmetry Acta V2.0	36.
Clarix MacWrite 5.0	119.	T/Maker Company WriteNow V2.0	98.
Letraset Ready, Set, Go! 4.0	279.	Word Perfect Corporation Word Perfect	185.

Spelling & Grammar Checkers

Aegis Development		Spelling Coach Professional Multi-User	279.
Doug Clapp's Word Tools	42.	Electronic Arts Thunder! 1.23	30.
A.L.P. Systems MacProof 3.0 (Requires MacPlus)	115.	Lundeen & Associates	
Deneba Software		WorksPlus Spell 1.1	46.
Coach Merriam Webster's Thesaurus 2.0	36.	Microlytics, Inc.	
Spelling Coach 3.0 (Webster's/Medical/Legal/Hyphenation)	54.	Word Finder (Synonym Finder)	35.
Spelling Coach 3.0 Professional (Adds Definitions & Thesaurus)	109.	Sensible Software Sensible Grammar	55.
		Sensible Speller	48.
		Working Software, Inc. Spellswell 2.0	42.
		Lookup (Makes Spelling Suggestions)	29.

Accounting Packages

Aatrix Software Aatrix Timecard	69.	Rags to Riches GL, AR, or AP	120.
Aatrix Payroll V3.0	115.	Intuit Quicken	35.
Aatrix TimeMinder	135.	Layered Insight One Write	189.
Aatrix Payroll Plus	195.	MECA Managing Your Money	129.
Bedford Software Simply Accounting	229.	Migent In House Accountant	119.
Chang Labs		Monogram Business Sense	81.
New Enhanced Version III Modules!		Dollars & Sense 4.0	87.
Rags to Riches 3-Pak 3.1 (GL/AR/AP)	289.	North Edge Software Timeslips III	119.
Professional 3-Pak or		Peachtree Back To Basics Professional (GL/AR/AP/INV)	159.
Retail Business 3-Pak	359.	Survivor Software	
Inventory Control 2.6 or		MacMoney 3.0 (Enhanced Version)	62.
Professional Billing 2.6	239.		

Networking Software & Hardware

CE Software Quick Mail	179.	Shiva NetModem V1200	369.
Imagine Software		NetModem V2400	489.
Multi-User Appointment Diary with Smart Alarms	85.	NetModem X232	309.
Infosphere		NetBridge	309.
MacServe (Network Software)	158.	SuperMac Software	
Microsoft Microsoft Mail 1-4 users	195.	Multi-User SuperLaserSpool	199.
Nuvotech		Network Diskfit 1.4	199.
EasyNet (Specify Din 8 or DB-9)	27.	Think Technologies, Inc. InBox-Starter Kit V2.0 (3 Personal Connections)	119.
TurboNet 128/512k or TurboNet Plus	27.	TOPS Tops 2.0 or Net Print	<i>Special</i> 199.
Olduvai Software Font Sharer	149.	Tops Repeater	129.

Graphics Software

3G Graphics Images with Impact!	60.	Comic Strip Factory	45.
ABA Software Draw It Again Sam...	89.	Innovative Data Design MacDraft 1.2B	149.
Adobe Systems Adobe Illustrator 88	325.	Dreams	319.
Aldus Freehand	379.	Laserware Laserpaint Color II	359.
Altsys Corp. FONTastic Plus 2.0	59.	Letraset ImageStudio	279.
Fontographer 2.2	239.	Macromind Videoworks II	118.
Ashton Tate Full Paint	75.	Videoworks II Accelerator or Driver for Hypercard	125.
Broderbund Print Shop	36.	Manhattan Graphics	
Casadyware Fluent Fonts 2.0 (2-Disk Set)	26.	Ready Set Show	<i>Special</i> 289.
Fluent Laser Fonts Vol. 1-19 (ea)	45.	Meta Software Design/2.0	199.
CE Software Calendar Maker 3.0	28.	Micro CAD/CAM MGMStation	685.
Clarix MacPaint 2.0	119.	Micro: Maps	
MacDraw II 2.0	309.	MacAtlas Paint 2.0 (MacPaint Format)	45.
Computer Friends Modern Artist	109.	MacAtlas Hyper Atlas	64.
Crickit Software Cricket Draw	169.	MacAtlas Professional	
Crickit Graph	119.	(PICT/ MacDraw Version)	129.
Crickit Presents	289.	Microsoft	
Deneba Software Canvas 2.0 (Includes Desk Accessory)	169.	Microsoft PowerPoint 2.0	249.
Canvas DA 2.0	75.	Olduvai Software Post-ART (3-Disk Set)	35.
Diehl Graphsoft Mini Cad 4.0	375.	Silicon Beach Software	
Dream Maker MacGallery (Hypercard or Paint)	<i>Special</i> 28.	Digital Darkroom	159.
Dubl-Click Software World Class		SuperPaint 2.0	109.
Fonts: Originals, Stylish or Giants	49.	Super 3D	159.
WetPaint: Classic Clip Art, Publishing, Animal Kingdom, Special Occasions, Printer's Helper, Industrial Revolution, Old Earth Almanac, or Island Life	49.	Super 3D Enhanced (Mac II)	249.
Enzan-Hoshigumi USA		Solutions International	
MacCalligraphy 2.0	109.	The Curator (Catalog Your Art)	79.
Japanese Clip Art Scroll I "Heaven" or Scroll 2 "Earth"	52.	Springboard Certificate Maker	24.
Year of the Dragon	21.	SuperMac Software Pixel Paint	259.
Foundation Publishing Comic People	25.	T/Maker Click Art Letters I, Letters II, Personal Graphics, Publications, Effects, Business Image, or Holidays (each)	28.
		Christian Images	35.
		Click Art EPS Illustrations	75.
		Zedcor DeskPaint 2.0	65.

Educational/Creative Software

Baron's Baron's SAT	35.	Venture's Business Simulator	47.
Bible Research The Word (KJV or NIV)	165.	Deluxe Music Construction Set V2.0	61.
Bogas Productions Studio Session	49.	1st Byte/Electronic Arts	
Broderbund Jam Session	30.	Kid Talk, Speller Bee,	
Geometry, Calculus or Physics	60.	First Shapes, or Math Talk	32.
Type!	31.	Great Wave Software KidsTime	26.
Where in the World is Carmen SanDiego?	25.	Concertware+ MIDI 4.0	79.
Coda Mac Drums	26.	Learning Company Reader Rabbit	33.
Compu-Teach Once Upon A Time	23.	Mindscape Perfect Score SAT w/The Perfect College	46.
Stepping Stones Level I or Level II	23.	Nordic MacKids	
Davidson & Associates Speed Reader II	39.	Educational Programs (each)	<i>Special</i> 29.
Math Blaster or Word Attack!	27.	Simon & Schuster Typing Tutor IV	35.
Electronic Arts Mavis Beacon Typing	36.		

Game Software

Access World Class Leader Board Golf	34.	Micro Sports MSFL Pro Draft	26.
Acolade Hard Ball	23.	MSFL Pro League Football	32.
4th & Inches	24.	Miles Computing Inc.	
Activision Firepower	16.	Harrier Strike Mission II or The Fool's Errand	27.
Shanghai, Romantic Encounters or Jinxter	24.	Mindscape Balance of Power, Crossword Magic or Citadel	30.
Might and Magic	37.	Deja Vu: A Nightmare Comes True	30.
Sky Travel	45.	King Of Chicago or Shadowgate	30.
Artworx Bridge 5.0	22.	Defender of the Crown, Siboot or The Uninvited	30.
Avalon Hill Mac Pro Football	28.	Practical Computer Applications	
Baudville Award Maker Plus	29.	Lunar Rescue	30.
Broderbund Ancient Art of War or Ancient Art of War at Sea	27.	MacGolf 2.0 or MacRacquetball V2.0	35.
Poster Maker Plus	39.	MacCourses	34.
Bullseye Software		Primera Smash Hit Racquetball II	21.
Fokker TriPlane or Ferrari Grand Prix	32.	Different Drummer	62.
Centron Crapmaster or RouletteMaster	28.	Sierra On-Line Leisure Suit Larry	23.
Electronic Arts Ogre	20.	Space Quest or Space Quest II	30.
ChessMaster 2000	28.	Police Quest	35.
Chuck Yeager Flight Simulator	36.	Silicon Beach Software World Builder	41.
Starfleet I	37.	Dark Castle or Apache Strike	27.
Patton vs Rommel or Scramble	27.	Beyond Dark Castle	27.
One-On-One, Pinball Construction Set, Seven Cities of Gold or SkyFox (each)	15.	Simon & Schuster	
EPYX Winter Games or Sub Battle Simulator	24.	Star Trek (The Kobayashi Adventure)	24.
Hayden Software Sargon IV	29.	Star Trek (The Promethean Prophecy)	24.
Infinity Software, LTD. Go	27.	Sir-Tech Mac Wizardry	35.
Infocom Leather Goddesses of Phobos, Nord & Bert, Plundered Hearts, or Sherlock (each)	24.	Sphere, Inc. Tetris	23.
Beyond Zork	30.	GATO, Orbiter, Falcon, or Pt-109	26.
Hitchhiker's Guide to The Galaxy	18.	Solitaire Royale	19.
Zork Trilogy	42.	Studio Zero Orbital Mech	35.
Microsoft Flight Simulator 1.02	32.	XOR Software NFL Challenge	64.
		Pro Challenge or Basketball Challenge	30.

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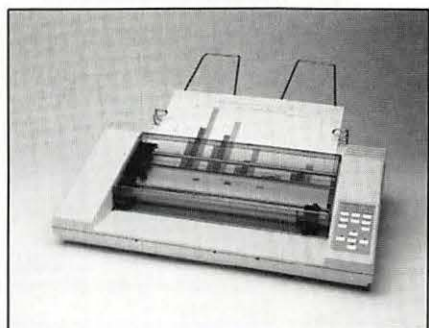
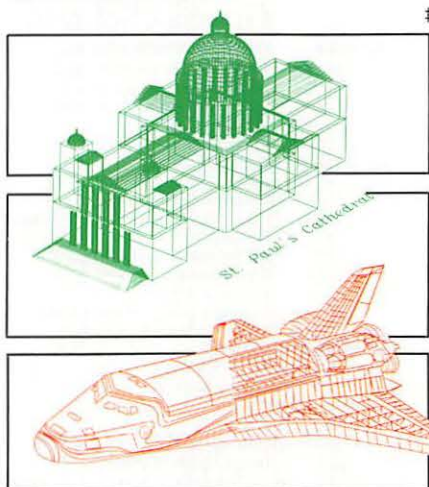
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Steven Levy

when a new one is only a little more? Here a subversive question comes to mind. Why does Apple make upgrades (with the exception of the 512K to 512KE upgrade) so costly—or impossible in some cases? The answer seems obvious: almost every person who sells a Mac in frustration over the difficulties of upgrading buys another new Macintosh. It would be interesting to see what would happen if a low-priced clone of a Macintosh SE were available. Perhaps then Apple would be more aggressive about selling upgrades.

Everybody Wins, Sort Of

Still, the choice is up to the seller whether or not to upgrade. While I suspect that many of those selling Macintoshes are too easily seduced by the lure of a new machine and don't need the SEs and Mac IIs they are trading up to, the Macintosh commodities market gives them a way to get some value for their old machines. Therefore the seller benefits from the commodities market.

We've already seen that the buyer benefits from the transaction—unless the machine drops dead a week later. (Sun Re-marketing does provide a 90-day warranty for buyers, just like Apple.) And Apple wins big, since the existence of a market for used Macs encourages its customers to sell their old machines and buy new ones.

Benefiting most of all are the companies like Computer Brokerage and Sun Re-marketing. Their executives spin grandiose plans for mass distribution, warehousing thousands of units, providing upgrades to bring machines up to Plus performance, and generally providing the low-end alternative that Apple itself is unwilling to offer the general public. Their vision is that the Macintosh, like the Volkswagen Beetle of yesterday and the Honda Accord of today, will continue to hold its value—an unglamorous yet pragmatic alternative to the new and flashy models.

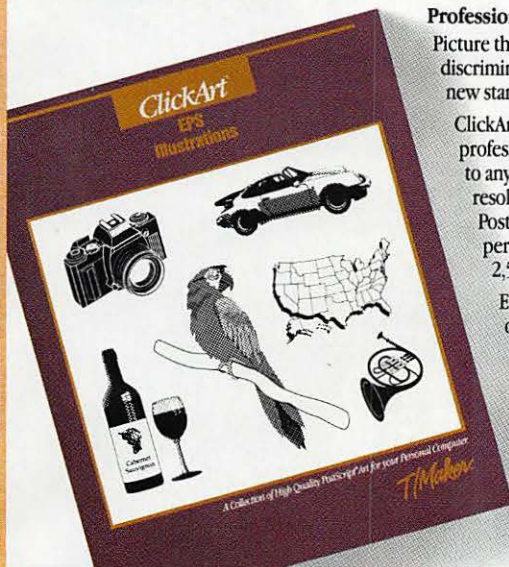
What happens two years from now, when the lowest-end Macintosh available from Apple has 4MB of memory; a 68020 processor; new, improved ROM; and other goodies not included in the current crop? And when the hottest word processors, spreadsheets, and games require all the power of those new machines?

Well, I guess you folks will be selling your SEs at the Used-Macintosh Commodities Mart so you can raise some money to buy that new computer. □

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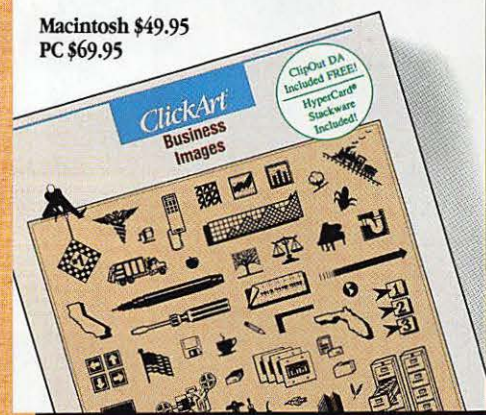
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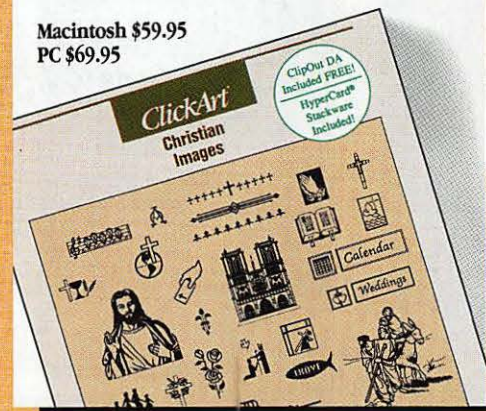


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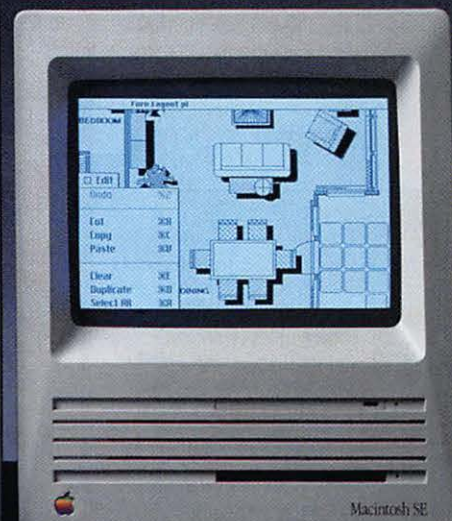
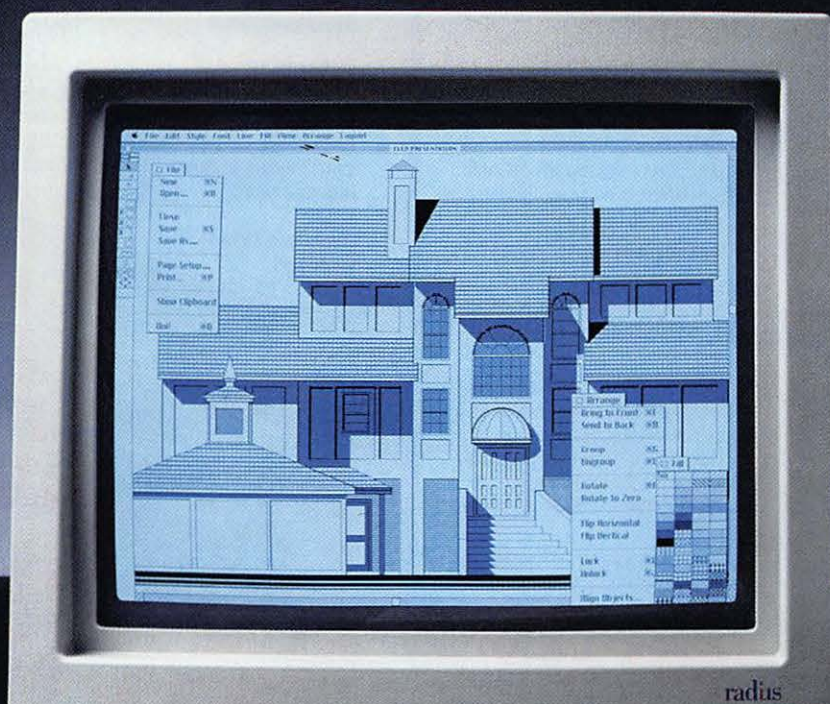
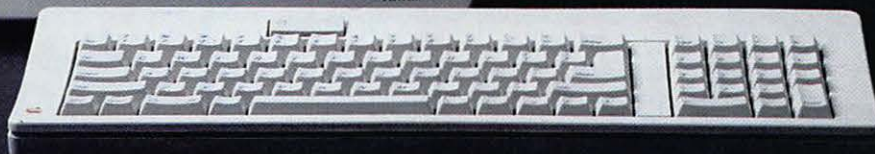
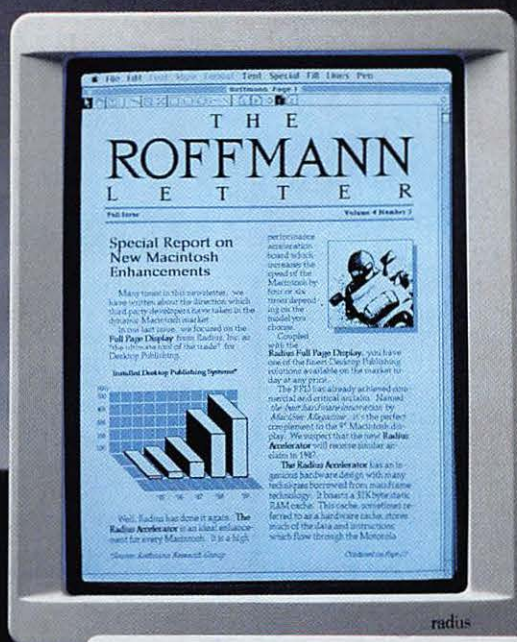
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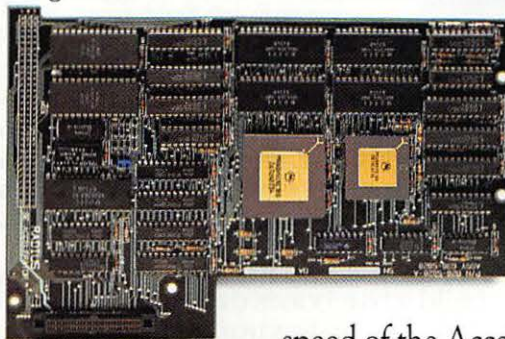
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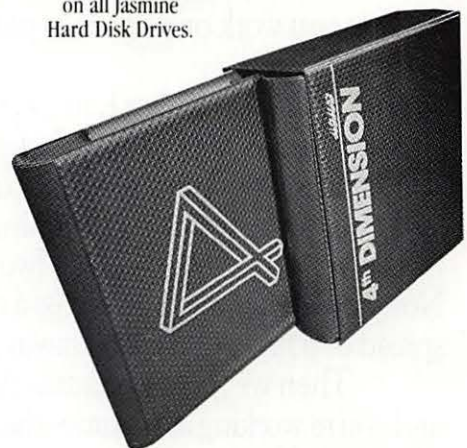
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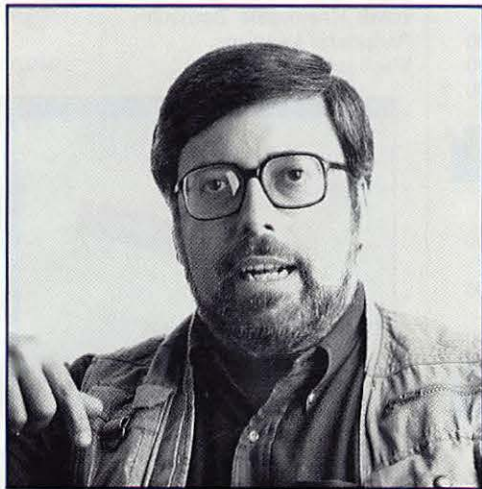


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*An interview with Danny Goodman, author
and stackware programmer*



Danny Goodman had written ten computer books, including Hands-On Excel (published by Scott, Foresman, & Co.) by the time Bantam Books released his Complete Guide to HyperCard last year at Macworld Expo in Boston. He had worked on it in secrecy for months while HyperCard itself was under construction, spending long hours with the HyperCard development duo, Bill Atkinson and Dan Winkler. As HyperCard rapidly captured the imagination of Mac enthusiasts, Goodman's book became an overnight hit. Goodman put HyperCard to the test while programming Focal Point and Business Class, the first commercial stacks, published last year by Activision (now Mediagenic). He recently finished Danny Goodman's HyperCard Developers Guide, forthcoming from Bantam, and he's working on a new version of Focal Point and an interface to a small device the size of two cigarette packs that could plug into the Mac and store your HyperCard scheduler for the road.

How did the reception of your book differ from what you expected?

I had no idea it would be such a success. It was completely dependent on the reception of HyperCard. And even within Apple, before HyperCard's release, there were a lot of people who were not in favor of HyperCard.

Not in favor of it as an Apple product? Or not in favor, period?

Some people were very concerned because HyperCard would be bundled with the Macintosh and would therefore represent Apple. Some had doubts about it technically; if people at Apple had doubts, so could the marketplace. It was a very radical product, impossible to describe. Here we are a year later, and it's *still* impossible to describe. How are you going to sell the Macintosh masses on such a product?

Maybe some didn't like HyperCard because John Sculley was the one championing it and forcing people to accept it whether they liked it or not. In *Odyssey* (Harper & Row, 1987) Sculley talked about the importance of consensus building, but HyperCard was something that came down from the top—not the way things usually happen at Apple.

Luckily it took off. I think people responded to the inherent quality of the product—it allows you to think flexibly and bring the power of the computer back into your own hands.

From the stacks you've seen, has HyperCard realized its potential?

Everyone is very eager to show me their stacks because they feel they've mastered the computer. That's why the stacks that first showed up on CompuServe were in the "Look, Ma, see what I've done!" genre.

I've proved that HyperCard is an enabling technology myself with Focal Point. Since the days of the Apple II I've been wanting something like Focal Point to organize my life. I just couldn't do the programming well enough in BASIC or Pascal or anything else I tried. I'm living proof that you can do programming with HyperTalk even if you couldn't in any other language.

I still can't manage external commands (XCMDs), which programmers write in other languages to add something HyperCard doesn't do.

What kind of extensions can we expect from XCMDs?

This year some very impressive communications XCMDs will be coming out.

There's an example in my new book that's a front end to the national weather service on CompuServe. You specify which cities you want weather for, and within a minute the XCMD's logged on and picked up the weather, put each city's weather on its own little card, and logged off.

We have to make telecommunications easier, get away from all these arcane commands. And we can do it in HyperCard.

When HyperCard first came out, people joked that it was a way to sell memory upgrades. Now it seems that it also creates a demand for more hard disk storage. How does that relate to HyperCard as enabling technology for the masses?

HyperCard may be pushing the limits of the basic machine now, but a year from now it won't be. A few years ago it was only the real nerdy power users who had hard disks. Today it's pretty difficult to buy a

(continues)

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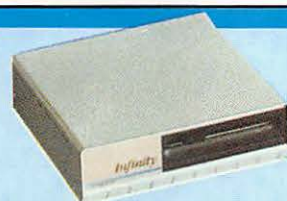
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I say don't bother to protect your stacks. If you have anything proprietary, put it in an XCMD.

computer without considering buying a hard disk. Despite this little bump in the price of memory we're experiencing now, memory will get cheaper, and so will storage.

As more memory comes around, HyperCard applications will be more accepted because you'll be able to keep HyperCard running all the time.

Some people feel frustrated because working with HyperCard is much more difficult than they had expected.

There's a very small pocket of people who don't find it as easy as they expected. It is programming, though it's much simpler

than any other kind of programming. It's easy to have a block about programming because we've been conditioned that programming is really only for techie people—it's difficult, and *you* shouldn't be doing it. It doesn't surprise me that some people have difficulty, but HyperCard has empowered a huge number of people.

Some professional programmers complain that HyperTalk allows—even *promotes*—sloppy programming. Do you think that's a valid criticism?

The sort of syntactical and character-by-character precision required in some other languages is just the stuff that's the barrier for the rest of us. Dan Winkler believes that HyperTalk scripts should look like poetry.

Poetry?

Well, very compact... like a haiku. I call Dan "Mr. $n-1$ " because if you give him a script to look at, he'll always find a way to shorten it by one line. His comment about poetry influenced me; now when I review my scripts I read them aloud. That forces me to reconsider whether it will all really make sense when someone else looks at the scripts.

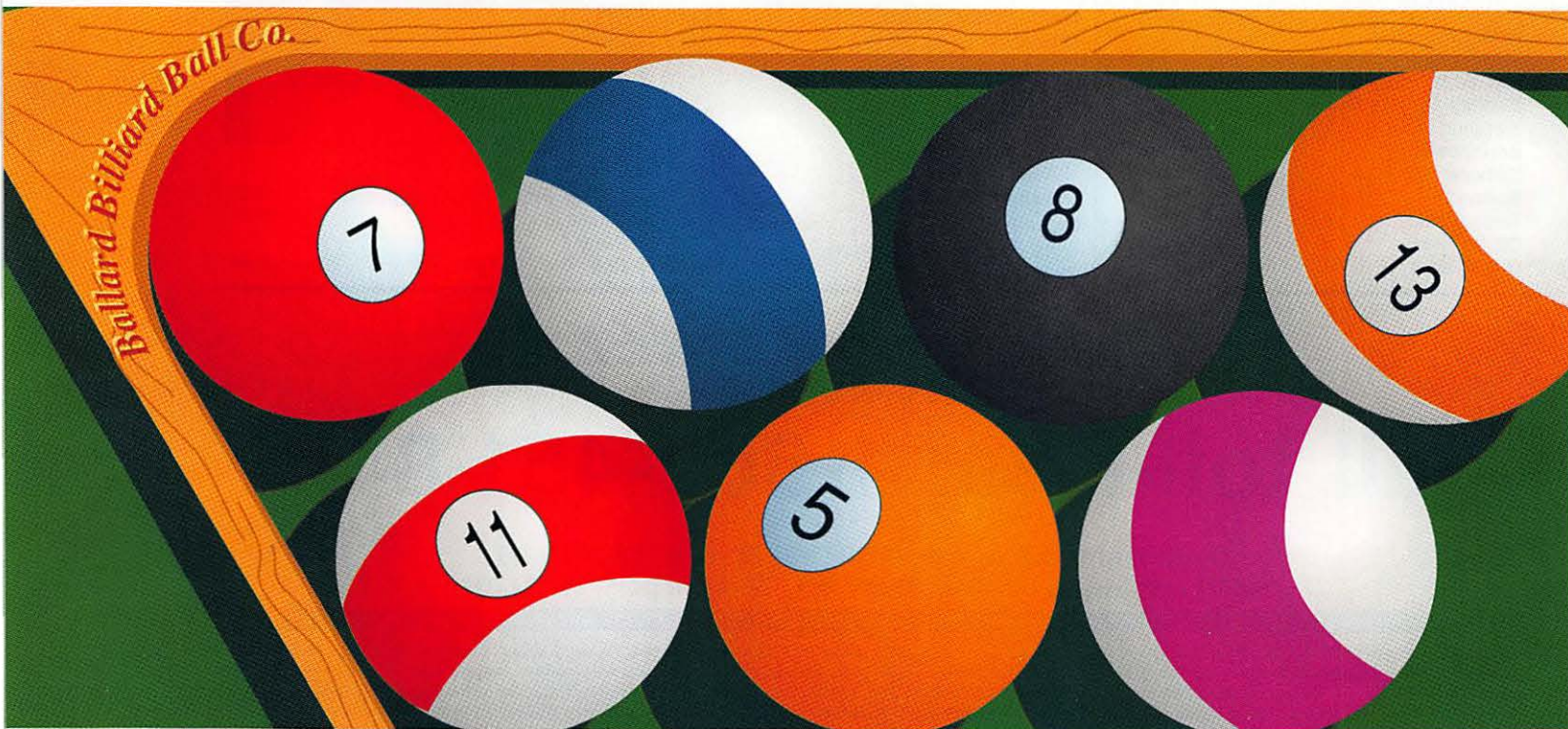
So it's not obscurantist poetry you're talking about.

No, and you don't want refrains. If you encounter refrains, you have a problem—it's time to look for a control structure of some sort.

Is stackware commercially viable, given that the code is not compiled and anyone can lift the code for another purpose?

I say don't bother to protect your stacks. If you have anything proprietary, put it in an XCMD, which is compiled and therefore protected. It's actually an advantage to

Took An Advanced Drawing Program To Create This Art



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Some people get so hung up on the idea of hypermedia and nonlinearity that their stacks just go wild.

leave everything else open because it allows the stack to be customized. You can even take something from HyperTalk and turn it into an XCMD if you're paranoid about losing it to the public domain.

Where do people have problems with HyperCard stack design?

The graphic design is very important; there's no way to stress that enough. My stomach turns when I see a card that has text you have to scroll because you're meant to read everything that's there. Divide it up into card-size chunks. It's a lot more engaging for me to click on a button and have a card dissolve to the next card.

Then there's the structure of the stack. Given the body of information to manage,

people are really not sure whether it should be one stack with four backgrounds or 45 stacks with one background each.

Some people get so hung up on the idea of hypermedia and nonlinearity that their stacks just go wild. They want to cram a million buttons on every card, until the buttons outweigh the information on each card, and it's hard to figure out where you are.

What questions should people ask themselves when they're planning a stack?

They ought to take the user's point of view. How will the user be accessing that information? Will it be in a story line, from beginning to end? Will it be searching for one fact down a hierarchy? Are the users likely to want to explore other points once they

reach that fact? If so, the stack structure shouldn't force them to go back to the starting point to find something in another branch of the tree.

What do you see as weaknesses in the current (original) version of HyperCard?

I have a long wish list for future versions. Everybody wants bigger cards, but I want smaller cards for simplicity. I don't like the idea of bigger cards, forcing somebody to scroll to find buttons on a card if they're using a small monitor.

I'd like to see HyperTalk performance improved, especially in doing math. I'd like a global text field, so I could put some text on the background in a field without having to store it with each card in the stack. I'd like to be able to sort text alphabetically in a container. I'd like more flexibility in searching so you could limit a search to a particular background card rather than searching a whole stack. And Boolean OR searches.

I'd like user-defined menus, so you could create your own menus and make

(continues)

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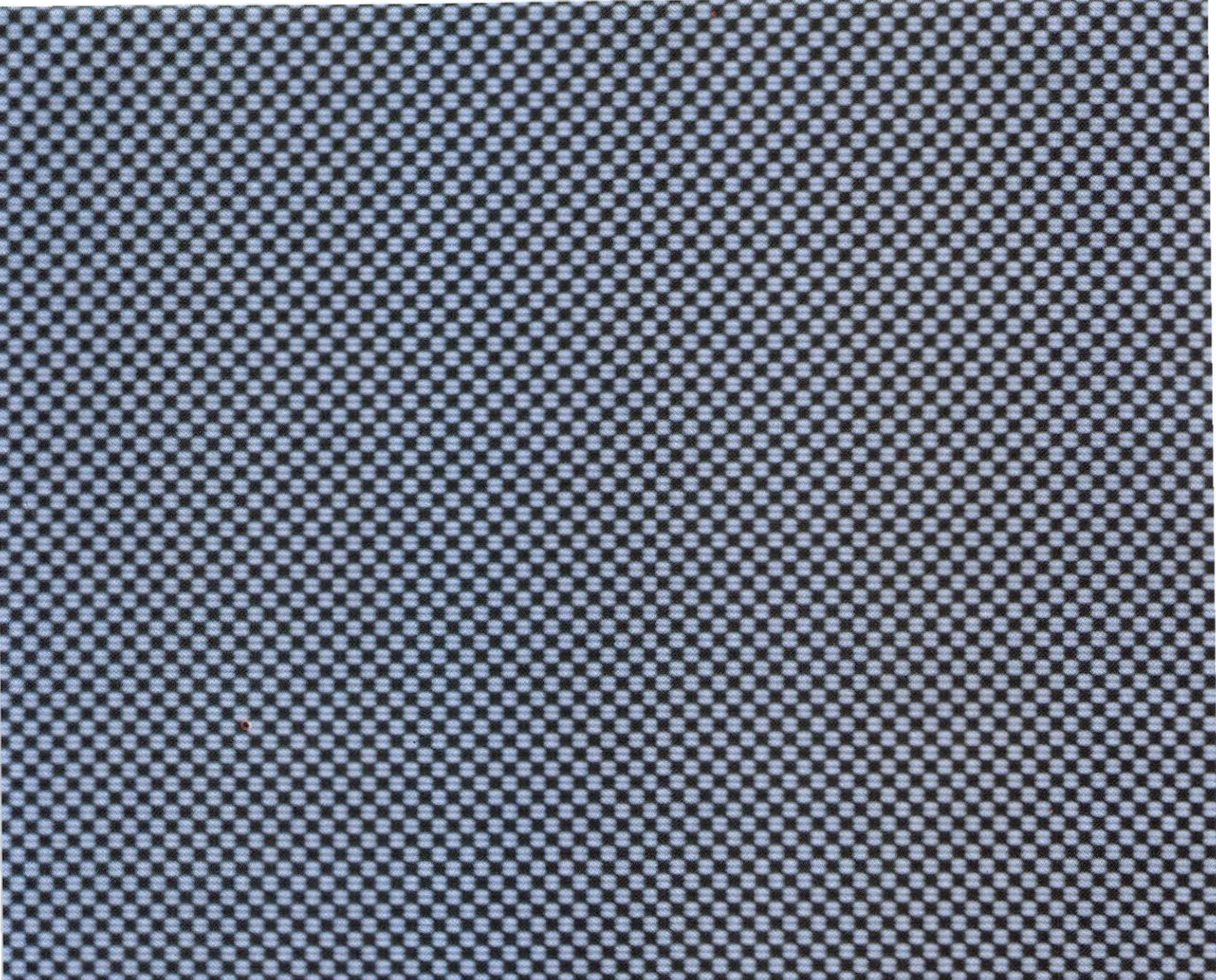
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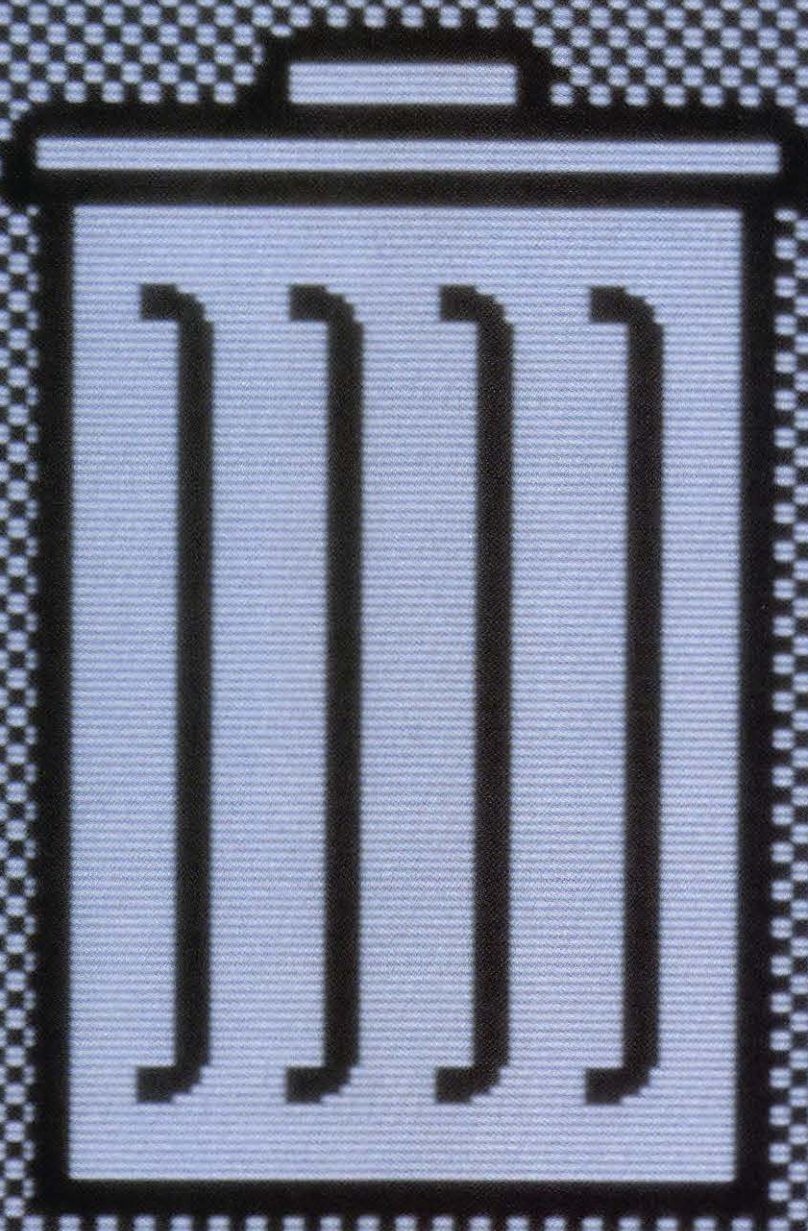
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Circle 241 on reader service card



If Bill Atkinson added everything that people are clamoring for, HyperCard would end up at 3 megabytes.

the HyperCard menus go away. Then you could build four or five different print commands into a stack's File menu, for example.

I'd like to be able to define irregularly shaped buttons so I can define an area, like a country shape on a map, as a button.

And I'd like a number of other programming refinements, such as real-time debugging, data verification for fields, and autohighlighting for radio buttons—just as there already is for check boxes. And global macros so I could launch applications in HyperCard and, while still in HyperCard, control what I'm doing in the other application.

You don't care about printed reports of the information in the stack then?

Reports, a product developed by Nine-to-Five and published by Mediagenic (formerly Activision), ought to solve that problem.

The whole subject of reporting gets into the question of whether HyperCard is a database. It was intended as a browser rather than a sorter—to let you look through cards. And I don't think there's anything wrong with that.

But if you define HyperCard as an information tool kit, as you have said, aren't reports important to users?

I've seen what Bill Atkinson has tried to cram into the memory and the code size. If he added everything that people are clamoring for, HyperCard would end up at 3 megabytes, and he'd have to deliver it on

streaming tape instead of floppy disks. The current version uses 750K of memory, but Bill does that for good reasons—to help performance and so that, if you make a mistake, you can undo it; there's a lot of forgiveness built in.

Are networking functions adequately supported in HyperCard?

Not at this time, but the forthcoming version will be a lot better. One thing that will still be lacking is some mechanism to allow more than one person to write to a stack at one time.

Are there any projects that people have approached you to do with HyperCard that you feel aren't appropriate for HyperCard?

Yes, there are certain things that really ought to be done in a relational database. HyperCard is not going to replace Omnis 3, and Helix, and 4D, and Reflex, and it was never intended to.

What about replacing Microsoft File?

(continues)

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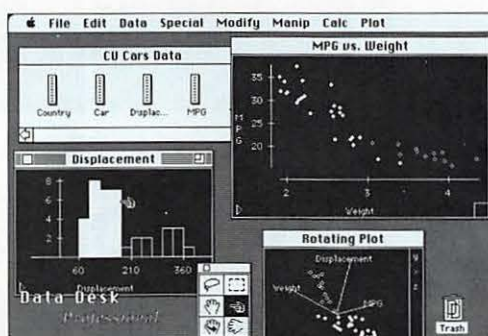
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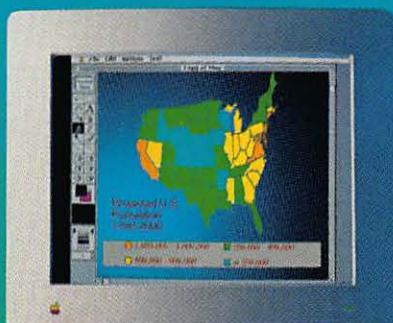
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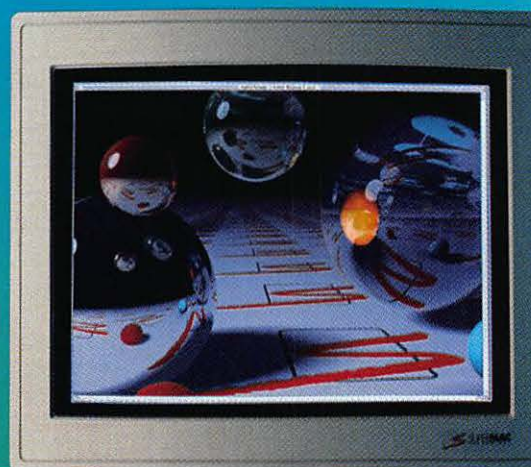
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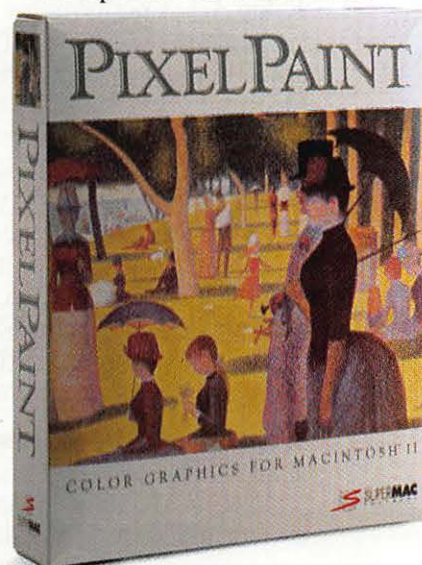
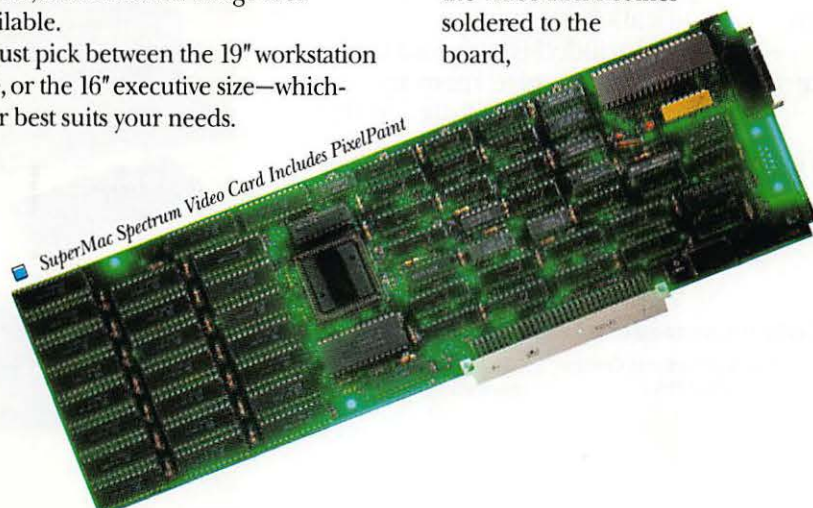
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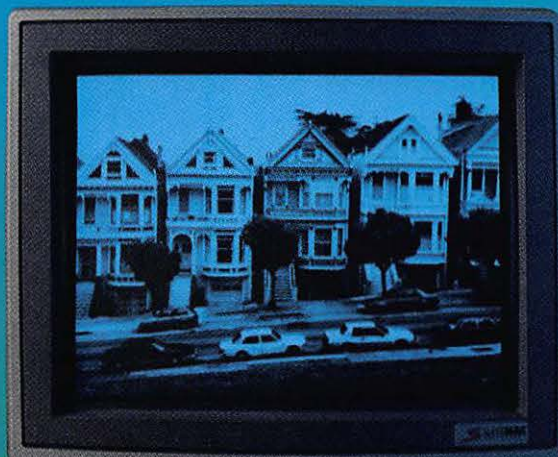
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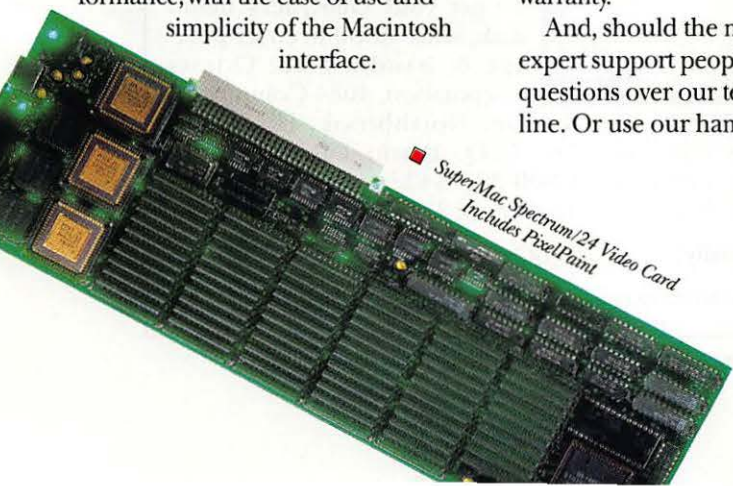
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Mac users are not going to settle for a Radio Shack Model 100 portable as a substitute.

In my book I look at the same exact data, and in one case it ought to be in HyperCard, and in another case it ought to be in a database. The difference is how you interact with the data. If you need flexible selecting and reporting and a variety of on-screen formats for the same data, then by all means put the information in a database.

HyperCard gives people a lot of power to control the way they manipulate information, but it's still a long way from John Sculley's Knowledge Navigator—with a friendly helper in the computer who does all the tedious research for you. How could HyperCard possibly lead to that?

I think it's possible, without completely severing the ties to the installed base, but it's going to take longer than we'd like.

Those of us at the leading edge of this technology—asking where is the Mac III—have to realize it will take a long time to get everyone up to the place where industry insiders are. There are still a lot of college kids using the Mac productively with only 128K of RAM and 400K drives.

To what extent does something like the Knowledge Navigator depend on the machines' becoming as widespread as the telephone? If you're going to automatically retrieve data from our culture's repositories of knowledge, the computer has to be able to reach the information.

And your mom has to have a computer, too. And the computers have to go with us. Today, you want to keep a lot of information in your stack, but the minute you leave your office you've left the information behind. And Mac users are not going to settle for a Radio Shack Model 100 portable as a substitute.

If HyperCard is for someone who sits next to a computer that's running all the time, that makes a big assumption about how people work today. In small companies, especially, several people may share a computer.

That's right. But it makes us clamor for a portable Macintosh that's under 15 pounds, preferably under 5 pounds. And affordable.

A lot of what's in HyperCard is ahead of its time. But I'd rather have the software ahead of its time than know I had a lot of hardware power that was going to waste. □

Interviewed by Nancy E. Dunn

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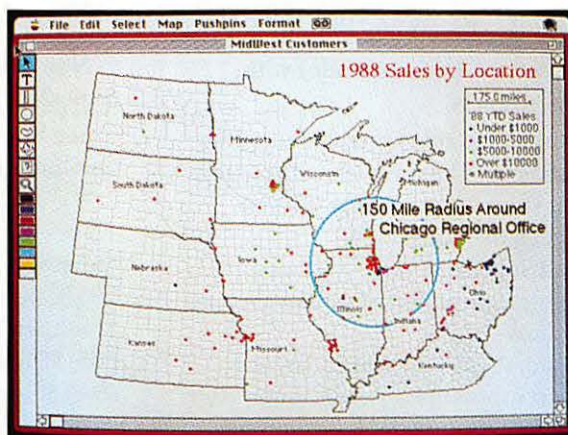
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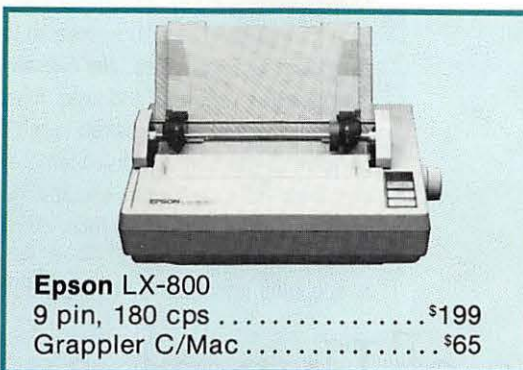
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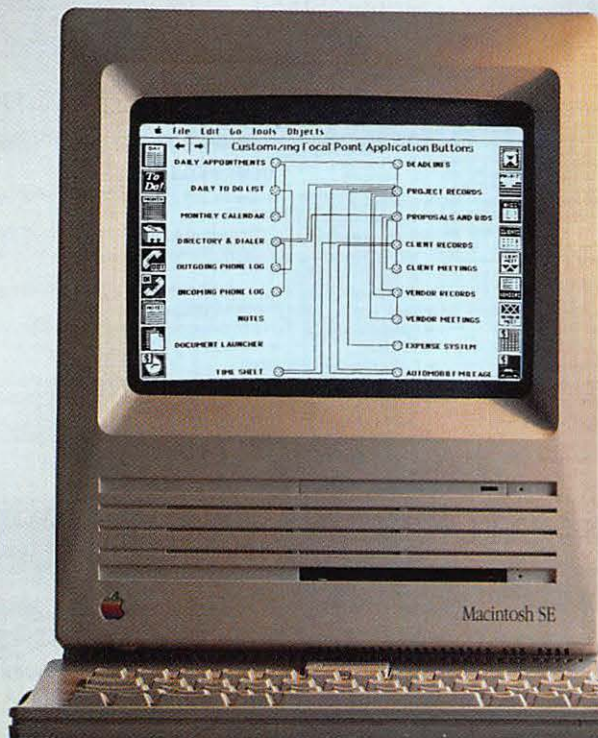
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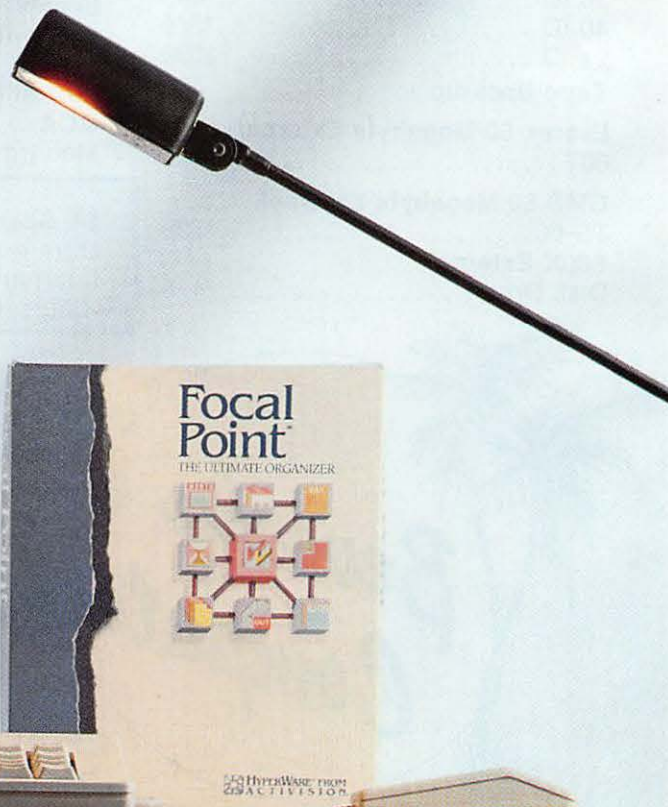
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**HYPERWARE™ FROM
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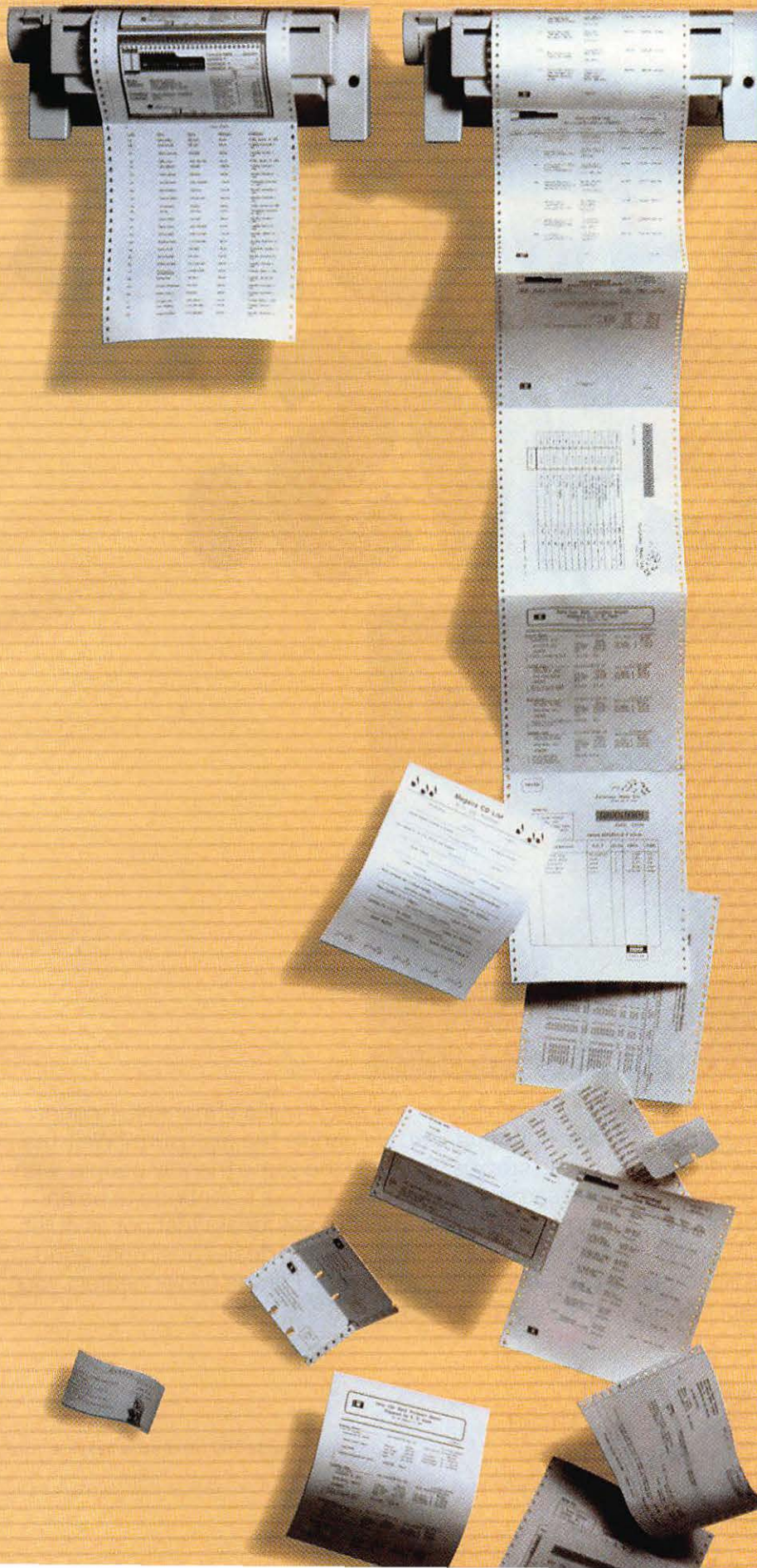
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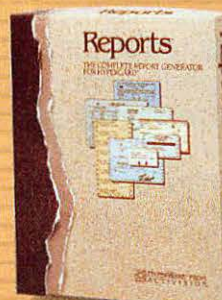
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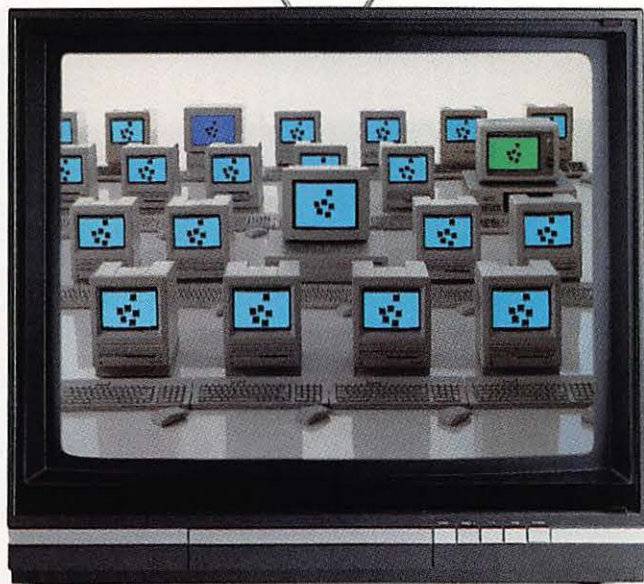
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Network news.



We always wanted to keep a low profile. But since we introduced the PhoneNET System two years ago, hardly a week goes by that we don't make network news.

A leading Macintosh magazine advises that you install PhoneNET for any AppleTalk network. The PhoneNET StarController was selected as the best way to build large networks. And reporters are calling MacRecorder the new wave in sound technology for the Mac.

The result is a quarter-million PhoneNET nodes, and counting. Can we handle the exposure? Well, the inside story is we're still the same friendly people, with the same great service. And we'll continue to be an innovative company with new ideas. Just not as quiet.

Stay tuned. Your Farallon dealer has more good news and a free demo disk. For the dealer nearest you, call (415) 849-2331, ext. 83.



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Circle 150 on reader service card

Macworld News

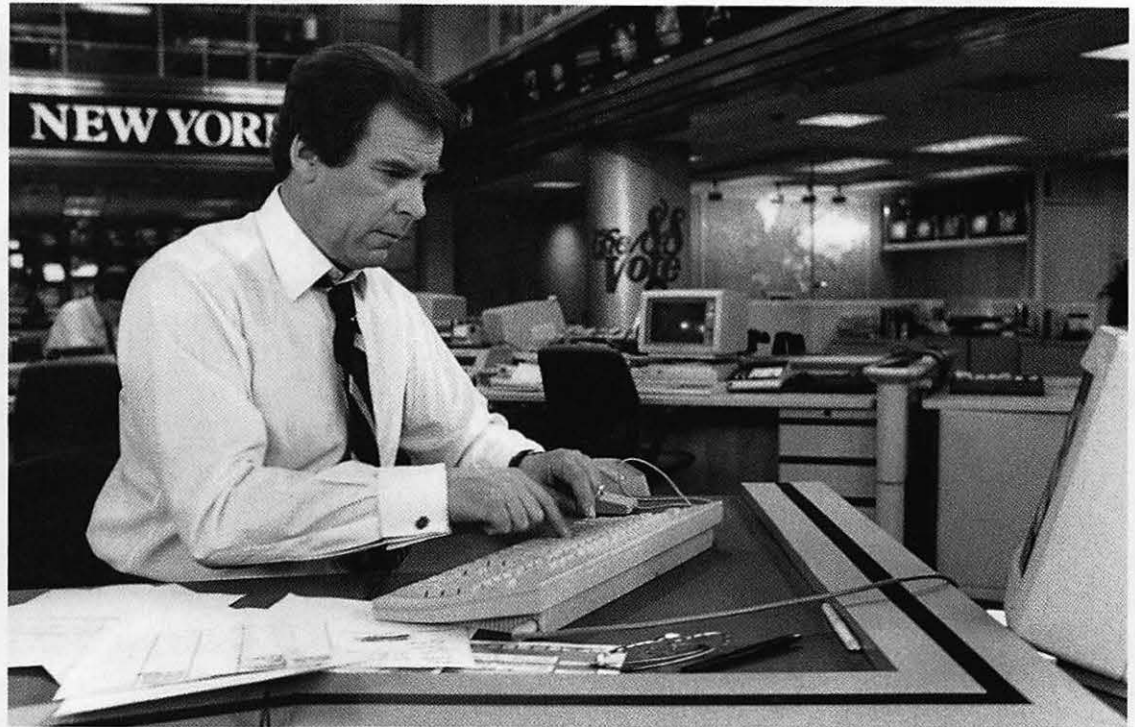
by Gil Davis

Stacking Up Candidates at ABC



At this summer's political conventions, a third ABC anchor sat between Peter Jennings and David Brinkley—a Macintosh II, loaded with ABC's secret weapon in its coverage of the 1988 presidential campaigns. This secret weapon is MAGNA, one of the most extensive feats of HyperCard programming to date. It was designed and maintained by the network's election specialists, with some help from Apple. With MAGNA, the entire ABC team was able to access information instantly on anything—from where Dukakis stood on Star Wars to who the key votes were in the Iowa delegation. Most striking, the data was fully accessible to Jennings himself, who could mouse his way into an up-to-the-minute delegate count, a recap of what happened on Super Tuesday, or even a record of his own notes on a given topic.

MAGNA (which stands for Macintosh ABC General News Almanac) is an interlocking set of HyperCard stacks holding thousands of campaign facts. It marks the deepest incursion that personal computers have made into the electronic news business. A virtual showcase of the powers of HyperCard, MAGNA not only allows computer innocents to get facts quickly and intuitively, it per-



Peter Jennings uses a HyperCard stack designed especially for ABC News to instantly retrieve up-to-the-minute information on this year's election coverage.

mits easy changes in the data. MAGNA, for instance, can reflect a rapidly changing situation—a floor demonstration at a political convention or an election-night tally. It allows Macs to shovel information to ABC personnel as smoothly as Holly Hunter fed facts to William Hurt in *Broadcast News*.

Dave Bohrman, ABC's senior political producer for election coverage, realized that HyperCard could replace the thousands of 5-by-7-inch cards the networks were using for covering major events like presidential campaigns. Once Bohrman

convinced his bosses to allow him to centralize the innumerable facts gathered in the course of the campaign on HyperCard, ABC cut a deal with Apple to lease ten Macs, some laser printers, a flatbed scanner, and several copies of HyperCard software. In addition, Apple provided support, including some programming on the interlocking system of around 130 stacks and over 5000 cards.

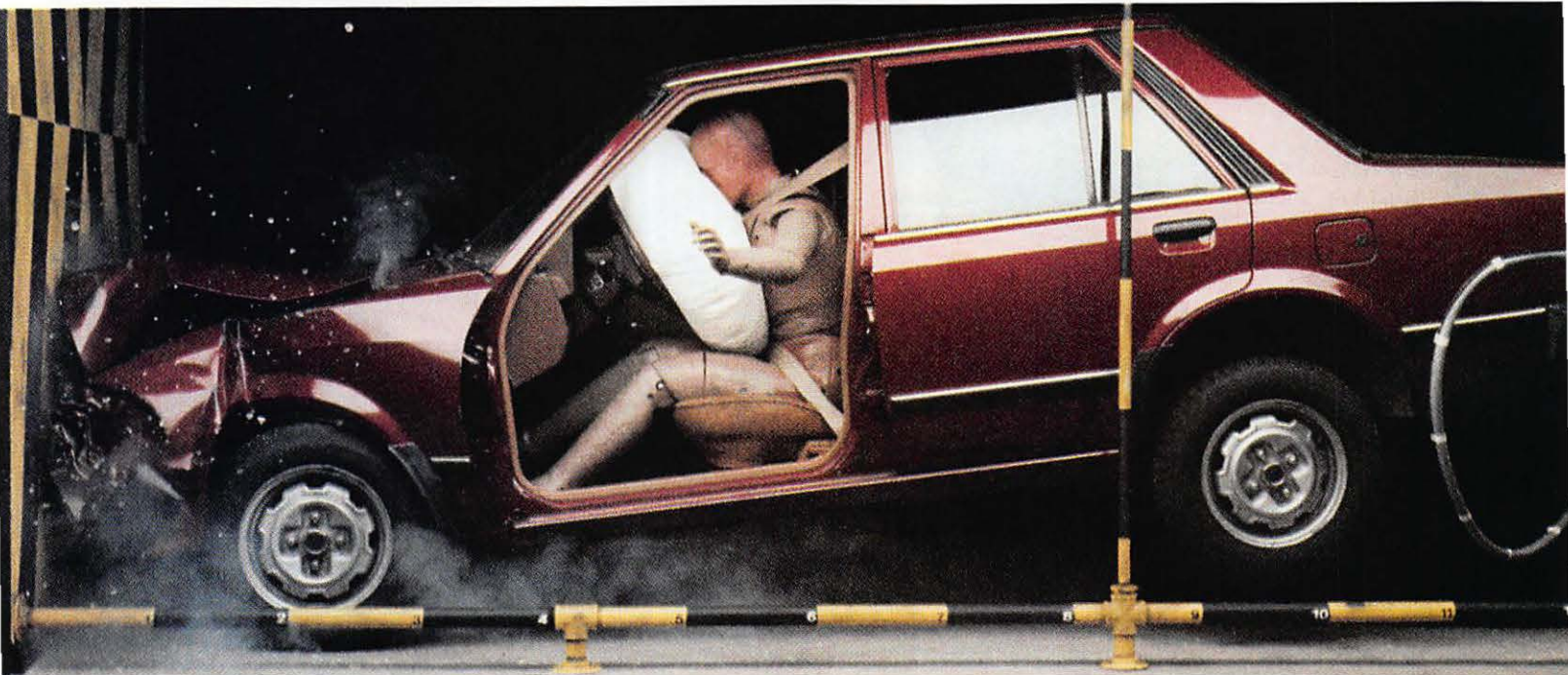
But most of the design and the HyperTalk work was done at ABC. One look at the attractive, clearly arranged cards tells you they were designed by experts in presenting visual infor-

mation on screen. During the primary season, for instance, one card contained digitized faces of all the Democratic candidates: click on the face of Dukakis and you got a card that linked you to his current delegate count (automatically updated), his stance on any given issue, his personal background, or information on his staff and finances.

At the conventions, layouts of the arenas in Atlanta and New Orleans were cross-referenced according to where each state delegation sat, and which re-

(continues)

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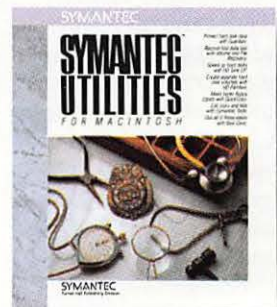
Guardian—protects and restores hard disk data and deleted files. **Disk Clinic**[™]—easy-to-use troubleshooting interface. Restores hard disk data and deleted files in case you have a crash before you can install Guardian. **Virus Protection**—protects systems against "viruses." **HD TuneUp**[™]—optimizes hard disks. **Symantec Tools**—views and edits data and resource forks of a file or volume in HEX or ASCII. **QuickCopy**[™]—makes fast floppy copies. **HD Partition**[™]—separates hard disks into separate volumes which can be encrypted.

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Circle 237 on reader service card

See Us At MacWorld Expo, Booth #5503



This card is a gateway to detailed information about each of this year's Democratic hopefuls.



Another of ABC's cards shows how Dukakis's delegate support has put him over the top.

porter was assigned to each area. The schedules and images of key players were stored in stacks so correspondents could find them in an instant. And ABC linked up the appropriate data from Mediagenic's City to City program so that information on hotels, restaurants, and emergency services was also accessible.

When we spoke to Dave Bohrmann in June, he was already savoring the edge MAGNA gave ABC over its competitors. "My counterpart at CBS caught a glimpse of the system in Iowa," he said. "He was extremely envious. He's trying to get Macs [at his network], but it's too late." Bohrmann thinks this type of technology will eventually be standard in electronic journalism. And besides HyperCard use, Macs have been making themselves indispensable at ABC in other ways. One night, the Mac II was even called into service as a make-shift TelePrompTer.

For now, watch for MAGNA on election night, where, as Bohrmann notes, "millions of people will see the results of HyperCard." From there, anything could happen. If Hyper-

Card works for Peter Jennings, perhaps the winner of the 1988 election will consider using a set of stacks when answering queries in his first presidential press conference. —Steven Levy

Networks That Sing

Many of the estimated nearly one million LocalTalk users have run into this popular network's major limitations: a maximum of 32 nodes on a network and greatly degraded performance when even as few as 16 users are online. Until now, it's been expensive to get to the solution—Ethernet—which easily handles 254 nodes at 40 times the data transfer rate of LocalTalk (Ethernet is so fast, a file server can perform like a resident hard disk).

Now Adaptec is offering Nodem, which it claims is the first cost-effective Ethernet connection for all SCSI-capable

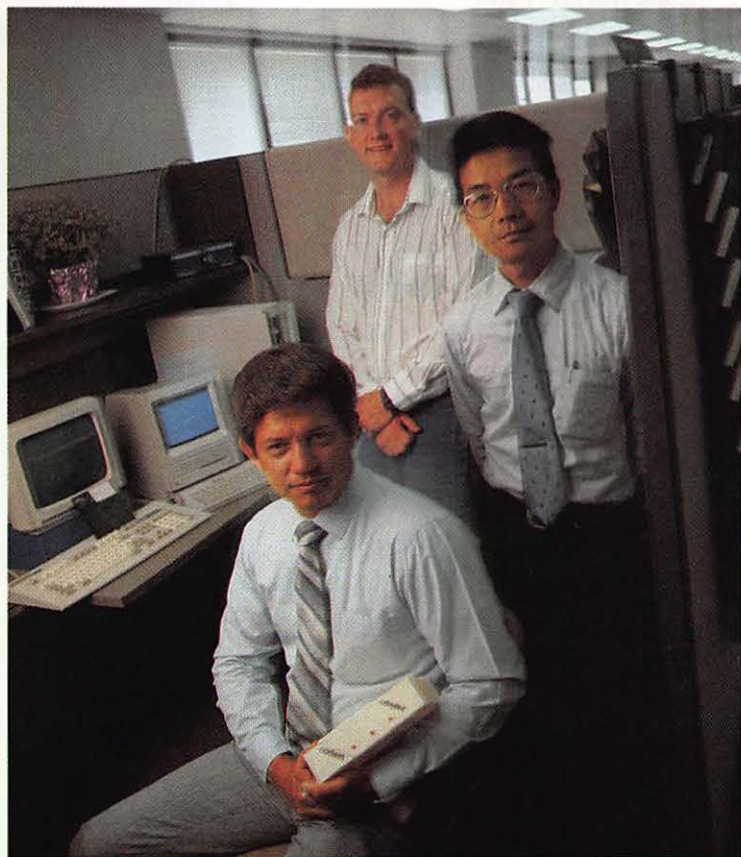
MS-DOS computers and Macs (all Macs except the 128K and 512K have SCSI ports). Nodem is a 2-inch-thick, modem-size box that's external to any computer—meaning that it doesn't take up an internal slot.

Nodem connects a computer's SCSI port to Ethernet's standard coaxial, or twisted-pair, cabling. When you turn on the computer, Nodem's software automatically configures the computer for transparent communications using AppleTalk, NETBIOS, and OS/2 protocols—there's no need to modify any application software or any procedures.

The implications? Not only could Nodem overcome many of LocalTalk's limitations, it could provide Apple with the low-cost connectivity capability it needs to become fully integrated into business, industry, and education. It could also of-

fer the opening that developers need to introduce the next generation of productivity software—software focused not on individual users, but on groups sharing and exchanging resources and information.

An increasing number of IBM-compatible computers have SCSI interfaces. For those that don't, Adaptec provides host adapters. Nodem for the Mac is expected to be available in September for \$545 for standard Ethernet cabling, or for \$595 for Ethernet twisted-pair or Cheapernet. IBM versions are projected to be available in the first quarter of 1989. (Other Ethernet connection devices range in price from \$699 to \$1250 and are produced by Apple, Dove Computer, Kinetics, AST Research, and 3Com.) For further information, call Adaptec in Milpitas, California, at 408/945-8600.



Engineers Pete Michels, Dave Sommers, and Shing Lin developed Adaptec's Nodem, which provides a low-cost, high-speed solution to networking Macintoshes.

DAN ESCOBAR

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On the surface, this Apple® appears to be a flawless, shiny Lisa™. But get under its skin and you'll discover Macintosh™ Plus capabilities in all their glory. There's just one way this Apple doesn't measure up to a Macintosh. At \$995*, the Lisa falls impressively short of a Macintosh price tag.

Meet the New Lisa with MacWorks™ Plus

We thought it looked like a perfect match: the highly efficient Lisa and the myriad of Macintosh software solutions. On the one hand, there was the Lisa, a professional business computer with an extra-large 12"



screen, Macintosh graphic interface, familiar mouse, easy-to-reach internal components, space for an internal hard disk drive, three expansion slots, and a numeric keypad on the keyboard. Then there was the popularity of the Macintosh Plus, with its amazing capabilities, functionality and software applications.

What we did to bring the two together was develop a software program called MacWorks Plus. MacWorks Plus brings Macintosh functionality to the Lisa, plus compatibility with every application that runs on the Macintosh Plus. With MacWorks Plus, the Lisa can run HyperCard, MultiFinder, AppleShare, WordPerfect, Adobe Illustrator and Cricket Draw. (To name a few.)



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runs the latest Macintosh software.*



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We do a lot more than market the Lisa and MacWorks Plus. We offer a complete line of out-of-production, new and used Apple compatible products. And we are the only company authorized by Apple Computer Inc. to sell and service their out-of-production equipment. Because of this, we have invested sizeable resources in developing improvements for all of the out-of-production and reconditioned products we sell. Plus, every product that comes from us must pass rigorous Apple quality control tests. We also back our products with a 30- to 90-day money-back guarantee.

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If you like the capabilities and compatibility of Macintosh, but don't like the price, pick the Lisa with MacWorks Plus. To order a Lisa, or get a copy of our product catalog, call 1-800-821-3221 and we'll send your order out today. All major credit cards accepted.

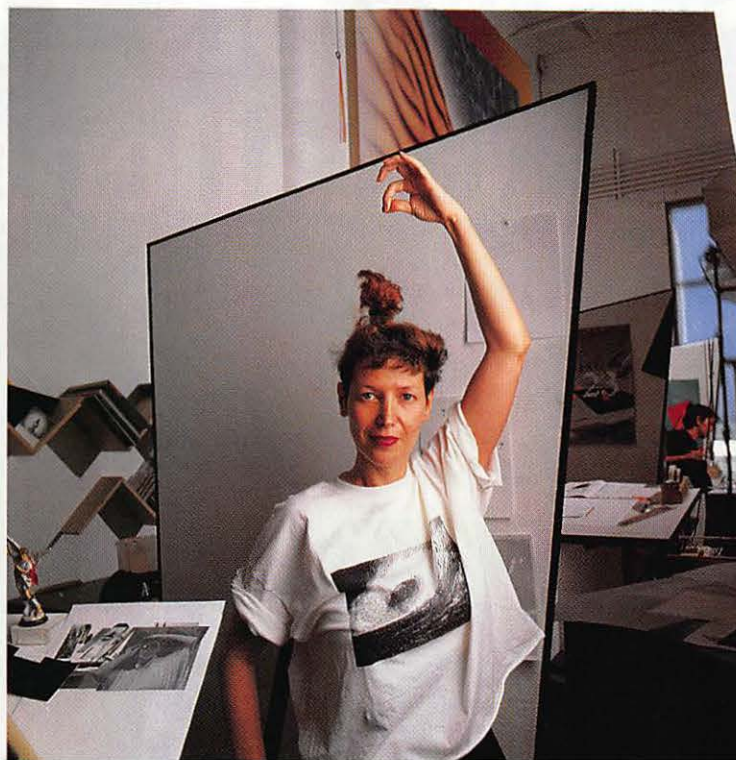


Macintosh Masters Winners



Choosing from nearly five hundred entries was a formidable task, but the judges concurred in naming April Greiman the grand prize winner and David Herrold the distinguished runner-up in the 1988 Macintosh Masters art contest organized by *Macworld* and sponsored by Adobe Systems, Aldus Corporation, Apple Computer, Cricket Software, Letraset USA, Microsoft Corporation, Silicon Beach Software, and SuperMac. (See the August issue for the first place and honorable mention winners in the eight categories.)

Greiman's entry, a whimsical installation entitled *Pacific Wave Sculpture*, served as a grand metaphor for the way in which Macintosh iconography invades our consciousness. The toolbox shapes and bold MacPaint textures that distinguish the oversize sculpture are familiar to all Macintosh aficionados. The sculpture even sported a visual pun—the Macintosh grabber engaging in a playful "wave." The piece was commissioned for the Pacific Wave Exhibition, an exhibit showcasing the work of California graphic designers at the Fortuny Museum-



April Greiman placed first in Macworld's 1988 Macintosh Masters art contest and won a Macintosh II for her studio.

um in Venice, Italy. Greiman is now the proud owner of a new Macintosh II, thanks to Apple Computer.

As head of the art department at DePauw University in Greencastle, Indiana, David Herrold can usually be found amidst the dust of the ceramic studios. During a recent sabbatical, however, Herrold brought video images into his Mac, embellished them using 3-D and paint software, and re-

assembled his work on movie film as an animation. The result, *Burnout*, is an adept tour of modern art in a mood that ranges somewhere between Kafka and Monty Python. As runner-up, Herrold received a check for \$2000.—*Suzanne Stefanac*

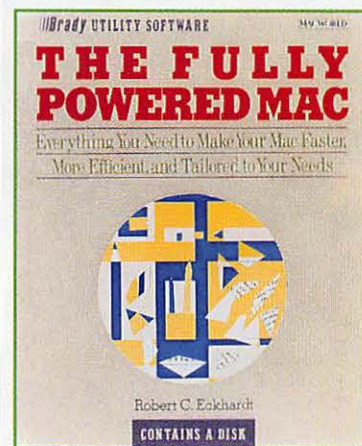
Fuel for the Mac



Toss all the books about the Macintosh into a centrifuge, spin, and gravity will separate them into four basic categories: introductions to the machine, designed primarily for beginners; overviews of applications, meant to supplement opaque software manuals; grab bags of tips for power users; and texts of arcana for programmers. Naturally, a few unique contributions to the Macintosh library will resist categorization and rise to the top. *The Fully Pow-*

ered Macintosh, by Macworld contributing editor Robert C. Eckhardt, is one such book.

The Fully Powered Macintosh, soon to be released by Brady Books, provides numerous strategies for making the Mac faster and more efficient without relying on massive hardware upgrades. The author deftly guides you through such thickets as creating the optimal System file; installing and using desk accessories, function keys, and fonts (Eckhardt advocates the liberal use of all three); and fine-tuning the Finder to fit your personal working style. He also demonstrates ways to



Here's a book for people who want a more efficient Mac without expensive upgrades.

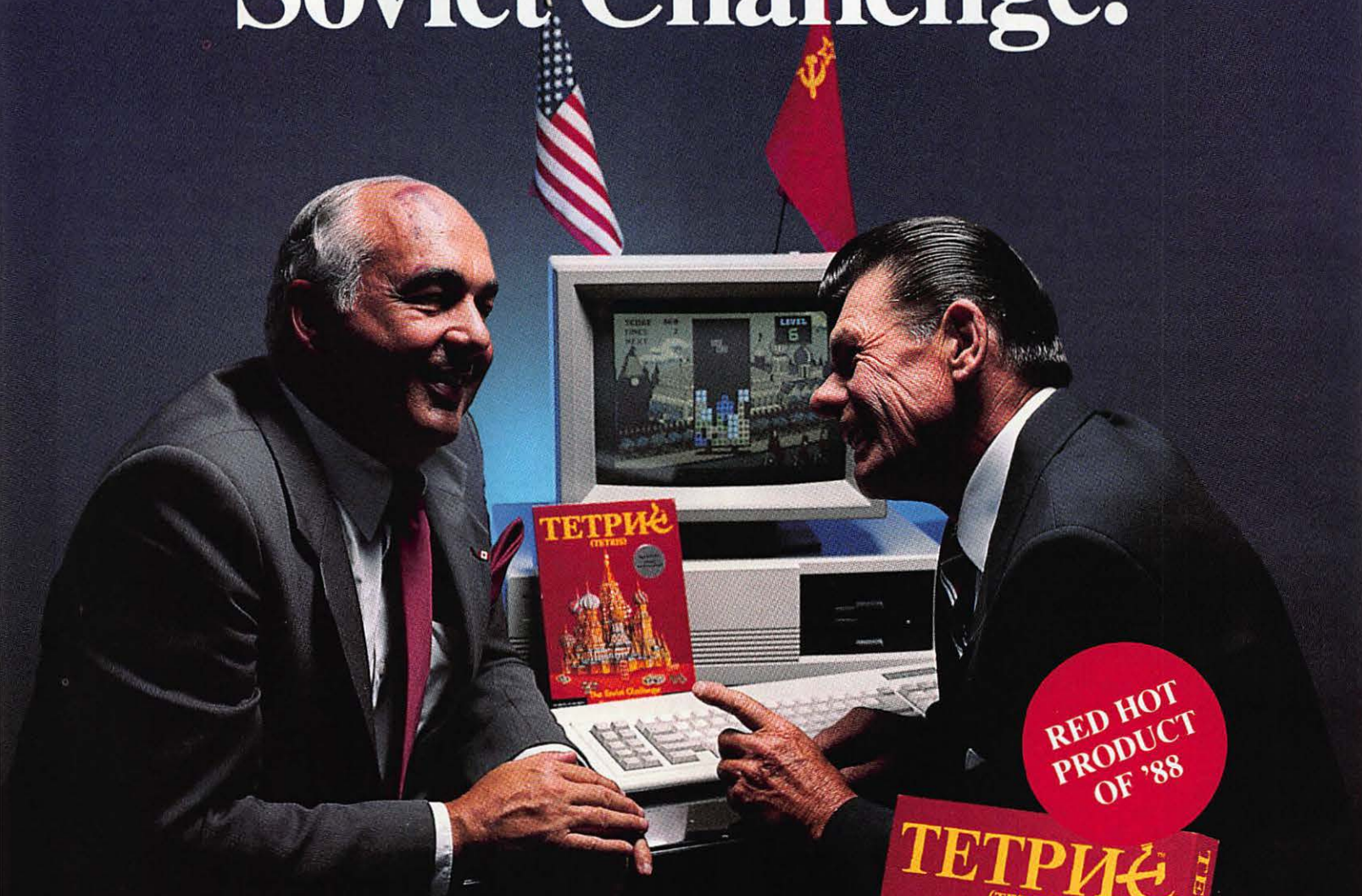
corral the applications you use most often so that they function as a single, integrated program. All this means speed and ease of use—even for those of us who are still struggling with a Mac Plus, a hard disk, and a megabyte of RAM.

The book is thoroughly indexed, copiously illustrated, and comes with a disk of public-exchange programs that let you experiment with the Mac as you read. At \$39.95, it's cheaper than many hardware upgrades, easier to understand, and won't become obsolete quite so fast. It certainly increased my enthusiasm for my Mac.—*William Freais*



These plans for April Greiman's prize-winning sculpture were faxed to Venice for construction and display at the Fortuny Museum.

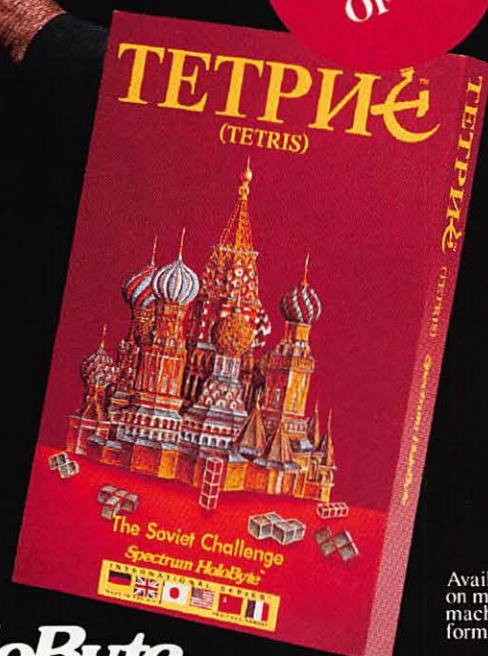
U.S. Accepts The Soviet Challenge.



What were the leaders of the two most powerful countries in the world really doing at the summit meeting?

A behind the scenes look revealed that the ultimate challenge was actually who could accumulate the highest score on TETRIS. Designed and programmed in the Soviet Union, this red hot new software package is sweeping the U.S. TETRIS has been

acclaimed by industry leaders as "devastatingly addictive," "compelling, fascinating," and "an irresistible lure." Available in retail stores everywhere, it is an absolute must for your software collection. Try it yourself. How high can YOU score?



Available on most machine formats.

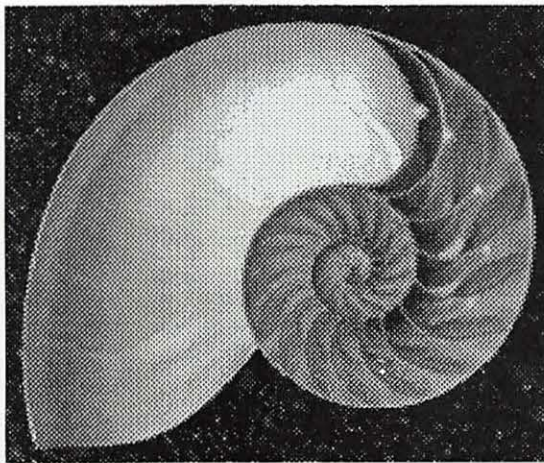
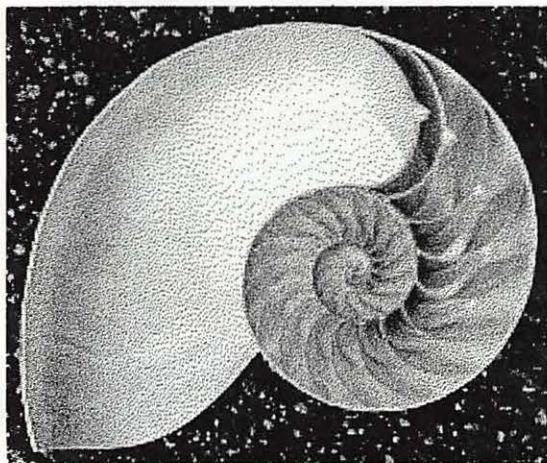
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Digital Darkroom's new Advanced Halftone printing (left) produces higher-contrast, clearer images using a PostScript or QuickDraw 300-dpi laser printer (regular PostScript halftone on the right).

New Image Processing



Mac users can now edit images with a host of new tools contained in Digital Darkroom by Silicon Beach Software. When it was first announced last January, the product's main claim to fame was its ability to convert a bit-mapped image into an object-oriented one that could be sized and reshaped without loss of resolution.

Since then, a number of features have been added to Digital Darkroom's object-based tools, including rotation, slanting, stretching, distortion, and perspective. Also new is the \$295 program's Advanced Halftone printing option; it produces images superior to those previously available and works with both PostScript and non-PostScript printers.

Silicon Beach also plans to ship another graphics program, Super 3-D, a \$295 graphics modeling program that creates images using simple 2-D drawing tools. You can view images by clicking on any of three *spin wheels*, which rotate the image around each of the three axes. Other viewing tools invoke up

to four light sources and increase or decrease the image's size. Super 3-D's other major capability, automatic animation, creates a series of frames between two positions of the object. For more information, call Silicon Beach Software in San Diego, California, at 619/695-6956.

More Speed for a II



The two latest entries in the "how fast can I make my Mac II run" competition are both like a computer within a computer. Each provides up to 20 times the processing power of the Mac II's 68020 processor by offloading compute-intensive tasks to its own microprocessor.

YARC's McCray board features a reduced instruction set computer (RISC) called the Am29000, which when equipped with the optional Am29027 floating-point accelerator computes 20 times faster than a Mac II with the 68881 math chip.

McCray also allows direct access to graphics and other

I/O NuBus boards under MultiFinder. Up to five \$4295 McCray boards can be used in a single Mac II. Software support includes an assembler, linker, and debugger for the Am29000 processor.

The second product is Mercury's MC3200NU array processor board for the Mac II. This board features a Weitek three-chip set called the XL and a

peak performance rate of 20 million floating-point operations per second. Mercury engineers were forced to develop their own NuBus interface chip for this board because Apple's current interface chip just wasn't fast enough.

Three to five MC3200NU boards can be installed in one Mac II. Mercury also plans to provide software algorithm libraries, as well as C and FORTRAN compilers, for the MC3200NU. The board will be available by September at a suggested price of \$10,000, with significant volume discounts. For more information, contact YARC of Thousand Oaks, California, at 805/492-8804 and Mercury of Lowell, Massachusetts, at 617/458-3100.

—Brita Meng

HYPERCARD

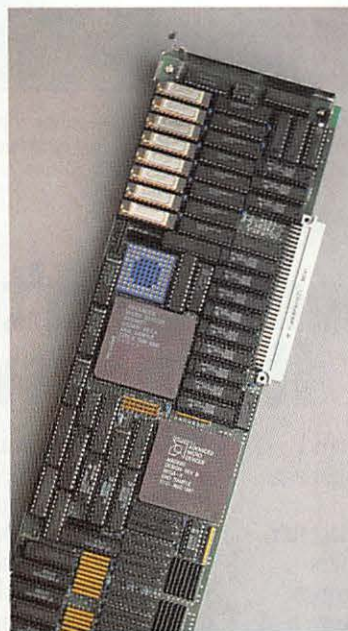
Powerful Stacks



As the number of HyperCard stacks grows, it's refreshing to find the better work being distributed free or as shareware. Before you shell out more than \$25 for any HyperCard application, check with user groups or information services to see if a high-quality product is available at nominal cost. Two new public domain stacks illustrate the point.

One is The Stack Starter, a highly advanced series of stack ideas from Robertson Reed Smith, an artist and HyperCard programmer. His voluminous creation is a help-yourself catalog of incredible HyperCard components: buttons, controls, effects, fields, icons, scripts, sounds, and tools. Many of these components are inge-

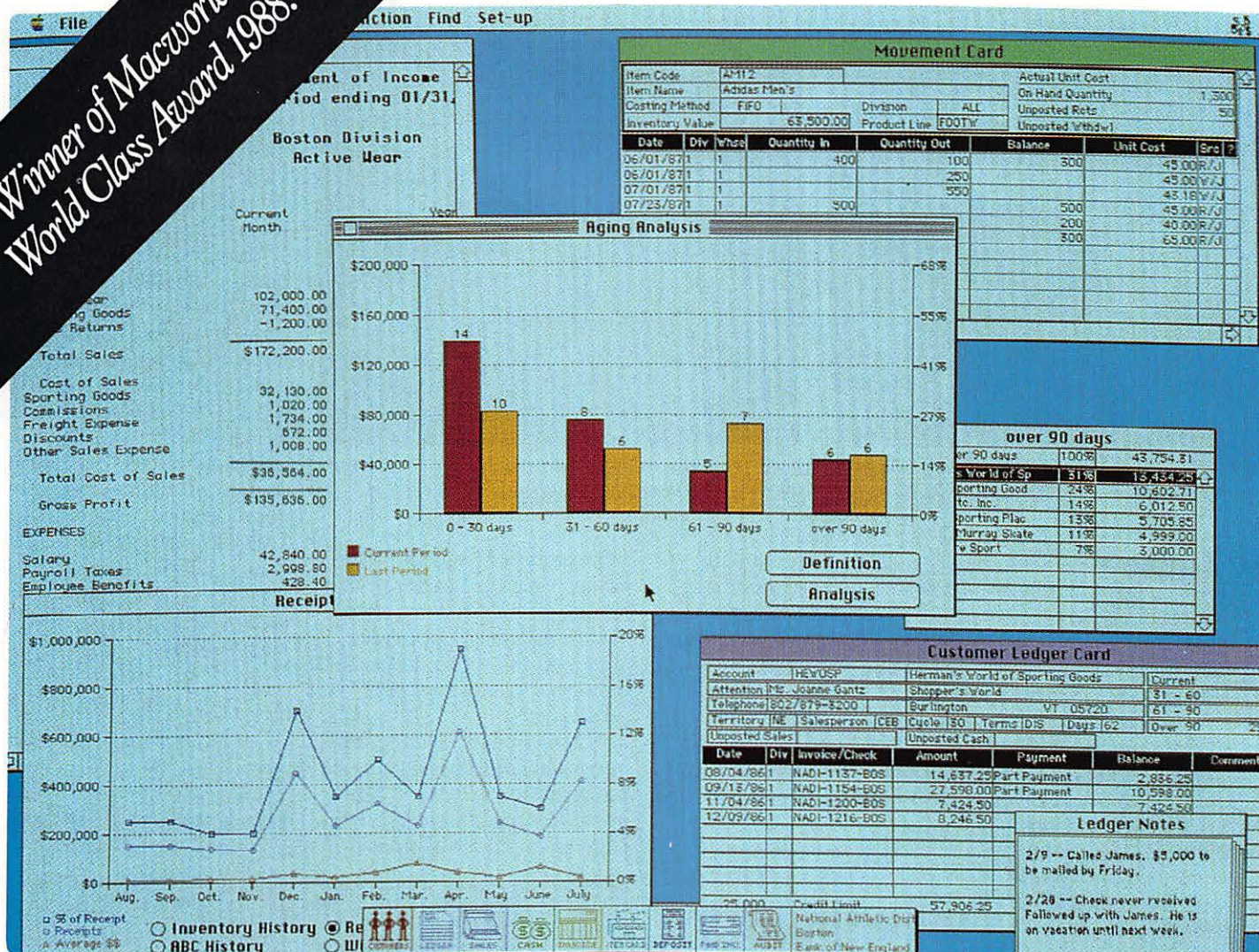
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A Mac II with YARC's McCray board can compute 20 times faster than a Mac II with the 68881 math chip.

LARRY IYTL

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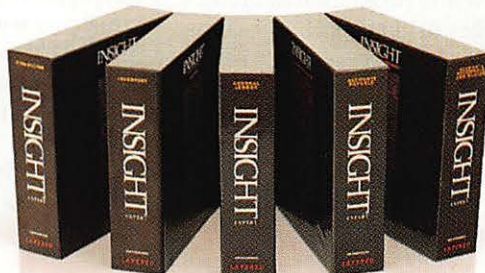
Insight modules include Accounts Receivable & Billing, Accounts Payable, General Ledger, Inventory, and Time Billing—and they're available in Multi-User versions. All are packed with high power capabilities, yet are intuitive and simple to use—like the Macintosh® computer they were designed for.

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Circle 128 on reader service card



Stack Starter, by public domain programmer **Robertson Reed Smith**, provides a wide range of ideas for HyperCard stacks.

nious enhancements of the standard items offered by HyperCard. The animated icons and the new set of buttons should find their way into stacks everywhere.

The Stack Starter stands out among the numerous other utility packages (some of which sell for up to \$100). The artwork is superior, with clicking padlocks, push buttons, on-off switches, gauges, and knobs galore. The stack exudes enthusiasm that is certain to find its way into your stacks. All underlying scripts are available and modifiable. Smith says he had to pare down his work considerably to fit it onto a single disk—so more offerings should be forthcoming.

The second stack handles HyperCard cataloging for users with burdensome floppy-disk libraries. Oscar F. Hills has contributed his stack, Auto Floppy Log, to the public domain. Auto Floppy Log is the first truly useful file cataloger because it can read all the files on a disk and insert them into a field. Previous so-called catalogers, which asked the user to type in file names, weren't worth the effort.

Auto Floppy Log does more than catalog a disk's files. Once you have been prompted to insert a floppy disk for cataloging, you can click on any file name for an illustration of the file's path name. In a separate

field, icons followed by arrows show you the path of folder names in which your file is buried. Double-clicking on a file name launches the file.

Disk information is stored in personalized disk boxes that act like folders. You can create new boxes or add file cards within a box. Information about each disk fits onto one file card. The graphics are excellent, though the single-card documentation needs a hearty rewrite. Auto Floppy Log uses an XCMD (a non-HyperTalk language) to read the file information from the disk. The scripts are not protected. Thanks to Oscar F. Hills for providing a free, extremely useful utility.—*Scott Kronick*

Publishing for Real



There are at least a few authors out there who not only desktop publish their own books, but who contract for printing and personally handle retail distribution as well.

Two such entrepreneurs are Arthur Naiman, who cowrote *The Macintosh Bible* (1987) with Dale Coleman; and Toni Michael, alias Saint Silicon, who

travels the trade-show and user-group circuit, selling his *Binary Bible* (1987). Both tried to find publishers but learned in the process that only a tiny fraction of all books are promoted enough by publishers to become profitable. So rather than having their own creations languish on shelves receiving only 10 percent of the wholesale price, they decided to become directly involved and to use the increased profits to finance their next books.

The two authors followed fairly different paths in producing their books. Saint Silicon wrote his by himself, then borrowed money to pay others to do the layout and all the importing and scanning of the dozens of graphics in the book. He shopped the entire country for the least expensive printer he could find and still sells most of the books out of his own hands.

Arthur Naiman enlisted everyone he could to help with

his book—a mixed group of authors, family, friends, and employees did the layout. A cooperative handles the book's distribution.

Both Naiman and Michael had saved money previously by desktop publishing on the Mac; they then extended their enterprising ways to the publishing and distribution of their own books. Vive la différence.

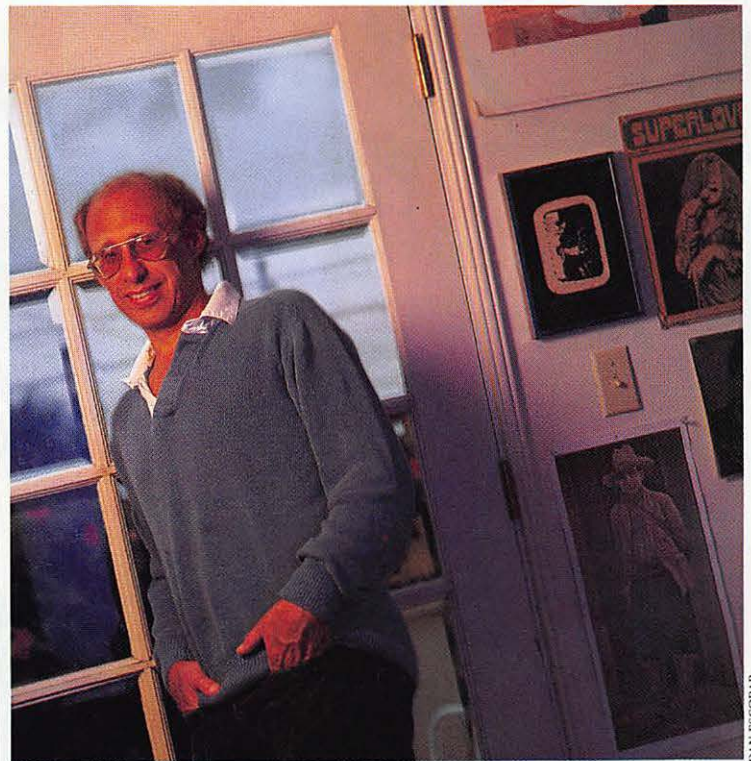
—*Scott Beamer*

Jasmine's New Drives



Jasmine Technologies, the first company to bring us fast, affordable, high-capacity hard disk storage, has had a face lift. Its hard disks now come wrapped in an elegant new housing,

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Arthur Naiman (shown) and his coauthor **Dale Coleman** have published and marketed their own popular book.

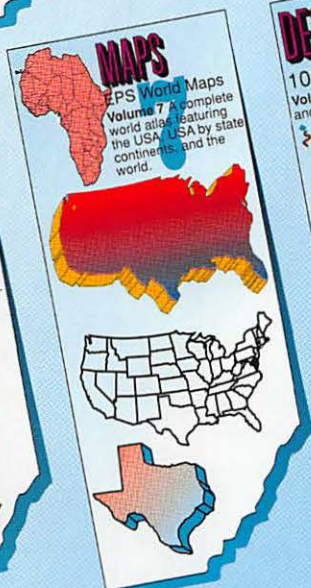
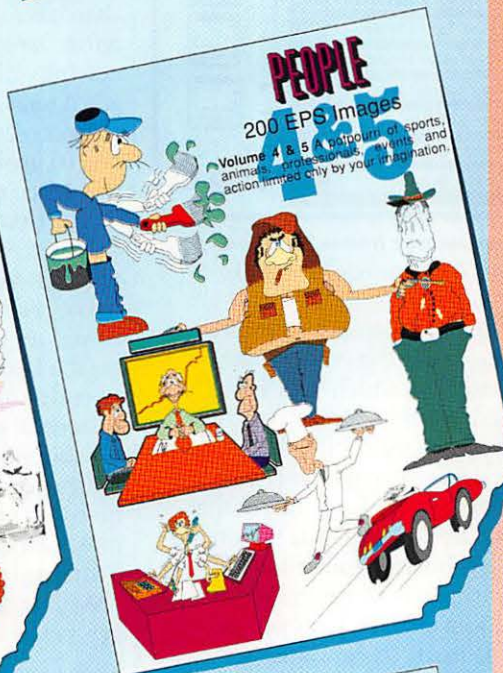
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DRAW

Attention

CREATIVE TOOLS FOR BETTER DESIGN

DIGIT-ART



MacUser Rating 5 mice!

Image Club Graphics Digit-Art vector based clip art and HotType PostScript Laser Fonts can be used with any popular Macintosh applications such as PageMaker, Ready,Set,Go, XPress, Cricket Draw, Freehand, and Illustrator. You can maximize printing detail with a PostScript laser printer including a Linotronic for typesetting sharpness. Image Club Digit-Art is easy to customize or add color for separations when used with Adobe Illustrator or Aldus Freehand. Unlike 300 dpi scanned, jagged bit-map clip art (edited only with programs like MacPaint), Digit-Art is PostScript. You will experience scaling and cropping flexibility **without any loss of image quality**. Your Image Club art is expertly rendered, perfectly vectored graphics, equivalent to the very best in line art when reproduced on a PostScript laser printer. Digit-Art clip art and HotType fonts by Image Club are available in diskette packages or on the ArtRoom CD ROM. Subscriptions in both formats are also available. For further information or for a dealer demonstration kit call 403-250-1969.

An innovative mixture of off the shelf Macintosh software produced this ad - color and all. We used a Mac 11, a LaserWriter, and Image Club's EPS color clip art and laser fonts from the ArtRoom CD ROM. The negatives were then output on a Linotronic.

Digit-Art	Disks	Format	\$	CD Demo	HotType
Volume	#800K	EPS / Pict	Price		Laser Fonts
1	3	• • •	\$99	State of the	1 Set \$149
2	3	• • •	\$99	Art Package	2 Sets \$259
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Jasmine's new family of streamlined drives offers more features at lower prices.

have user-removable air filters, and are bundled with powerful software such as Redux (an excellent backup program) and Symantec Utilities (the old Mac-Zap, completely reworked). And that's not all.

Jasmine's driver software executes rigorous testing of the hard disk during formatting. It also performs automatic error correction later while reading from the drive—which should help keep the dreaded "This file couldn't be read and was skipped" dialog box from appearing when you are copying files. How? If the software finds a bad block, it tries to extract any data from the bad block and move it to a good block. If the program can't read the data, it'll lock off the bad sector, so that you won't ever write to that sector again, obviating the need to reformat the hard disk.

As if that weren't enough, Jasmine now offers true SCSI partitioning, compatible with Apple's A/UX. You can assign a password to each partition, even if that partition is the start-up device. Just supply the magic word on boot-up and you're in.

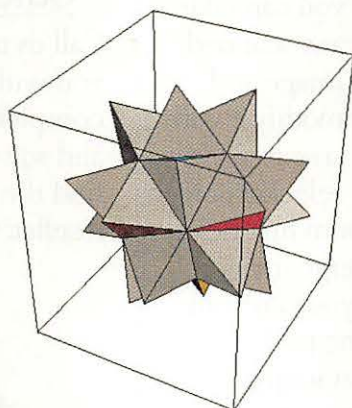
What's more, Jasmine's new drives cost less than its previous line of Direct Drive hard disks did. Couple this with a general improvement of overall quality and reliability plus a two-year warranty, and you'll see that the new stuff will be a tough act to follow. —Rob Hahn

Math Power on the Mac



The language of mathematics and the ability to deal with symbolic expressions has until now been too demanding to be available on personal computers. Mathematica, a program for manipulating and solving mathematical equations and quickly graphing the results, promises to bring the language of mathematics within reach of the Mac II—giving scientists, engineers, and mathematicians a powerful new tool.

Described as one of the most powerful mathematical packages available today, Mathematica's problem-solving prowess ranges from evaluating simple mathematical expressions and functions, to solving complex polynomial equations



Once Mathematica completes a calculation, it can graph the results using 3-D and color.

and evaluating integrals and derivatives. In addition to dealing with algebraic and symbolic formulas, Mathematica can calculate numerical approximations. The program also includes a powerful programming language that lets users create their own interactive textbooks or workbooks.

One of Mathematica's strengths lies in its extensive 2-D and 3-D graphing capabilities. Expressions and data can be represented as contour plots, similar to topographic maps; as density plots, where values can be represented as shading levels; or as wire-frame or shaded surfaces. Users con-



Stephen Wolfram of the University of Illinois Computer Research Lab developed Mathematica.

trol color, light sources, and viewpoint: options analogous to those offered by a camera. Mathematica outputs graphics in PostScript; it can output formulas and equations in TEX, C, and Fortran.

Because the program is divided into two major parts—a kernel that executes the computations, and a front end that implements the user interface—Mathematica is ideally

suitable for running on a network. Both parts can reside in the Mac, or network users can run the front-end on a Mac while the kernel runs on a powerful mainframe like a Cray. The SE and Plus versions are priced at \$495, while the Mac II version sells for \$695. At press time, versions for 15 other UNIX-based machines were planned. —David Ushijima

You're Under Arrest

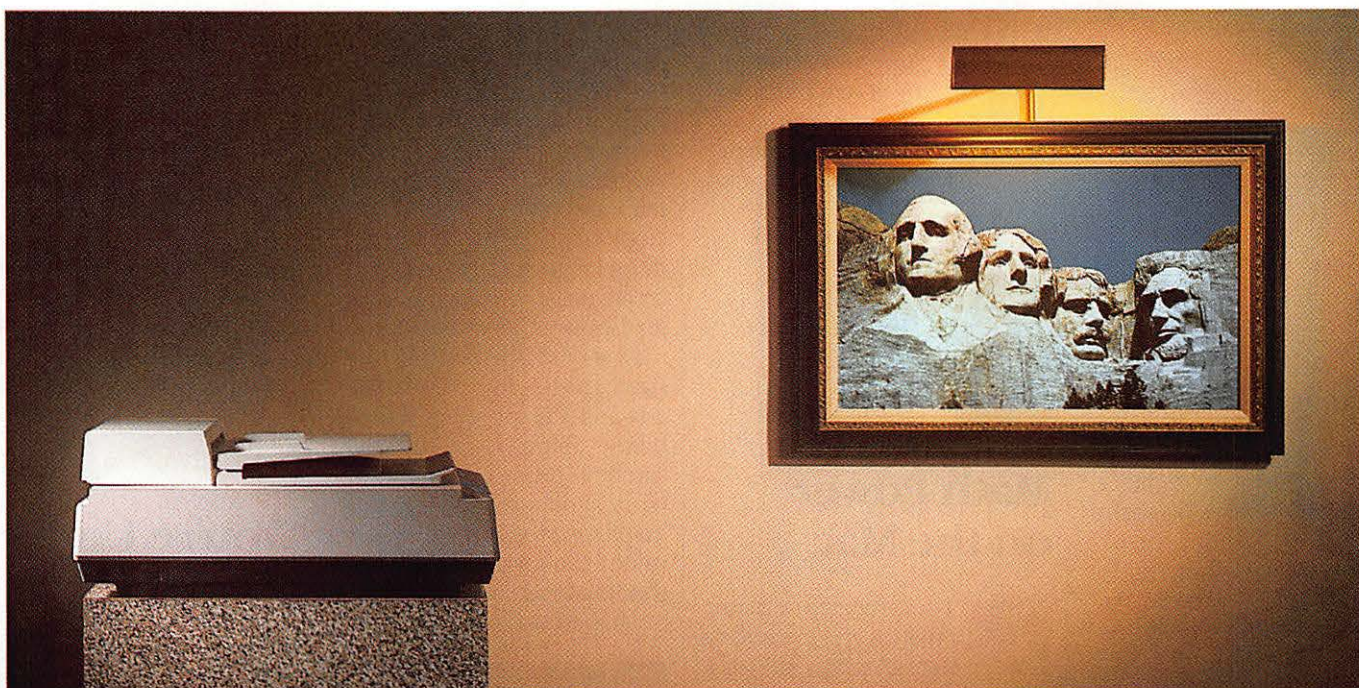


If you're lucky, your name will never be typed into one of the Mobile Macs that are specially designed for arrest and incident reporting by police, fire, ambulance, and civil defense officers. Each name appears on a digitized form; the officer merely fills in the blanks, and a laser printer provides the output.

The functional size of the screen is much larger than its actual 7 inches, thanks to a screen-expansion program called Enable that can zoom in on any part of the report and magnify it. The special screen is connected by cable to a flat computer module that contains a 512KE logic board and one or two 800K floppy drives. The CPU module is mounted under a squad car's dashboard, where a keyboard can be secured with Velcro. Should the report need to be completed inside the police station, the officer can quickly detach the CPU and keyboard and plug them into a 12-inch Colby Big Top monitor and 115-volt power supply.

Officers at the Redwood City, California, police department seem to like their Mobile Macs—the department just ordered 25 more. It still has one problem to solve, however: who's

(continues)



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going to buy the 23 MS-DOS laptops it rejected as too cumbersome?

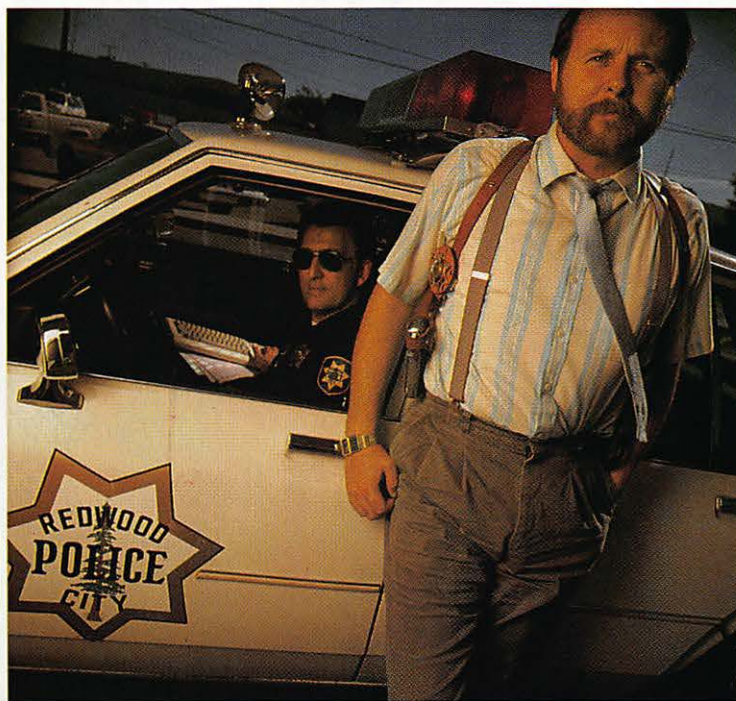
Suggested pricing for volume purchases (of 20 or more units) begins at \$1816 per unit. More memory and a second disk drive are extra. For further information, call Colby Systems in Fresno, California, at 209/222-4985.

Virus Remedies



Will 1988 be remembered as the Year of the Virus? After a relatively harmless Macintosh virus made its appearance early this year, some felt that the computer press overreacted by giving the story front-page coverage. Computer viruses are small programs that quietly attach themselves to any System files and applications they come in contact with; viruses have the potential to cause serious damage by altering data or rendering computer systems unusable.

The Macintosh community responded to the threat by making available special files (like CE Software's Vaccine) designed to detect and remove viruses. Apple joined the fray and released an application called Virus Rx; you can obtain it from



Detective Steve Switzer (standing) and Officer Milt Borgens (seated) record arrests on Mobile Macs mounted in their squad cars.

a user group, a local bulletin board, or a major network service.

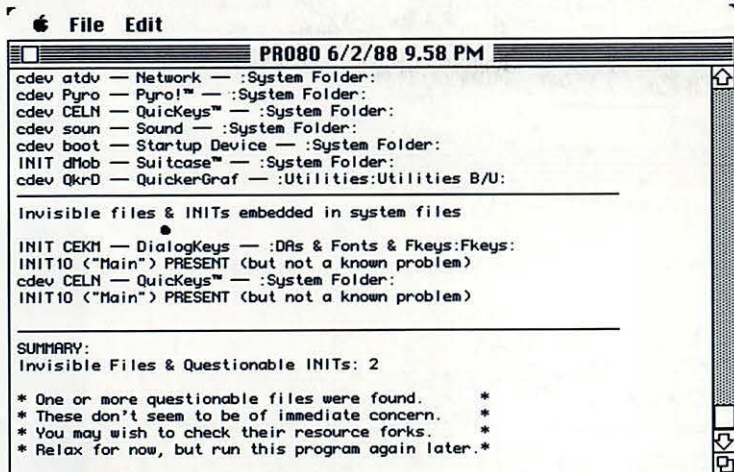
There is no way to absolutely guarantee that a system won't become infected, but you can play it safe by following a few simple rules.

1. Don't use new noncommercial applications without testing them for a few days first, by running them from a floppy disk with the hard disk turned off.

2. Make frequent data-file backups, and keep the original application disks write-protected.

3. If you suspect that the System file or any application on a hard disk is infected, the surest cure is to reformat the disk and restore it from scratch.

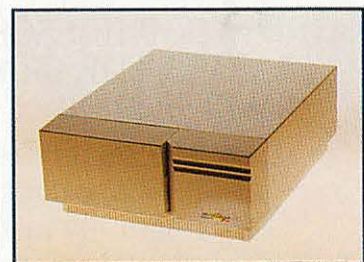
—Franklin Tessler



Run Apple's Virus Rx and it will look for a virus in your files, and then print a report.

well as all screen fonts. The FR1 is able to output images created with up to 16.7 million colors and comes with a desk accessory for colorizing images on black-and-white Macs. A company spokesperson claimed that the \$5995 film recorder will be able to produce slides with up to 4000 lines horizontally and 4000 lines vertically in an average of three minutes. Multiple film backs are also planned—such as a Polaroid back in October, and a third-party bulk-film back in the third quarter.

The FR1 Film Recorder is the first product in the Montage Presentation Series. The series offers a novel approach to packaging color output devices: sharing components in an effort to reduce costs. In the third quarter, Presentation Technologies also plans to offer a 300-dots-per-inch color thermal printer for under \$5000 that shares the rasterizer in the FR1. Yet another product, the Mon-



This Montage FR1 Film Recorder can output slides using up to 16.8 million colors.

Slides by Montage

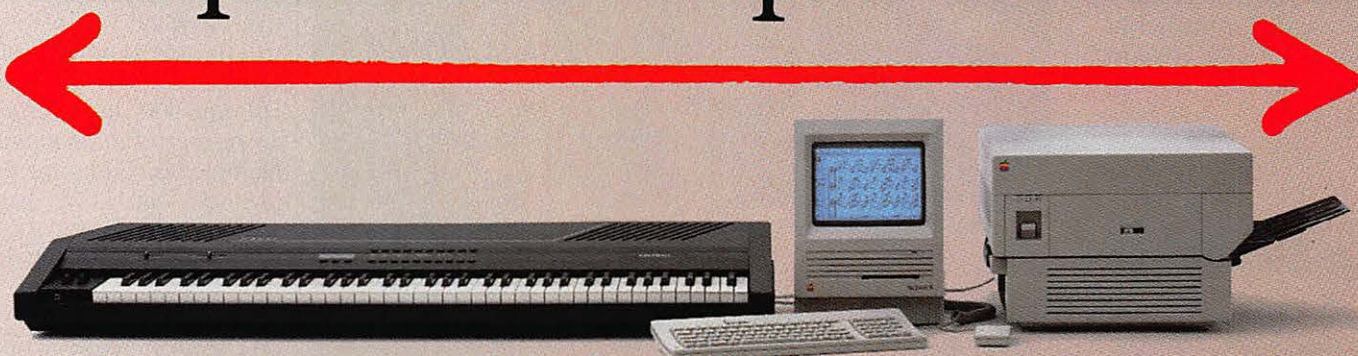


For the last two years Presentation Technologies has provided the only film recorder for the Macintosh—the ImageMaker. As other companies announce film recorders for the Mac, it's not surprising to see Presentation Technologies countering with a new offering of its own.

The Montage FR1 Film Recorder uses a digital imaging design that provides hidden-line removal, handles bit-mapped images, and supports LaserWriter Plus typefaces as

tage Graphics Manager, will be a proprietary expansion chassis with plug-in cards. The first of these will be a PostScript processor for producing color PostScript images. Both the thermal printer and the film recorder will be able to use the capabilities of the Graphics Manager, including networking options planned for future versions. The Graphics Manager and PostScript boards should become available by the end of 1988.—Adrian Mello

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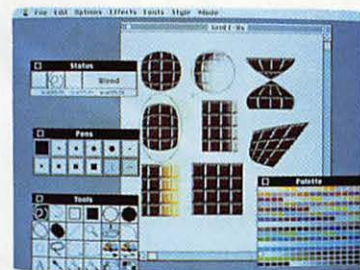
Finale's publisher-quality scores are a sight for sore eyes.

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Color Tools for 3-D



Now you can wrap any kind of color graphics around 3-D objects: for example, you can create your own image of various worlds by wrapping flat maps around spheres, cones, or other regular geometric shapes.

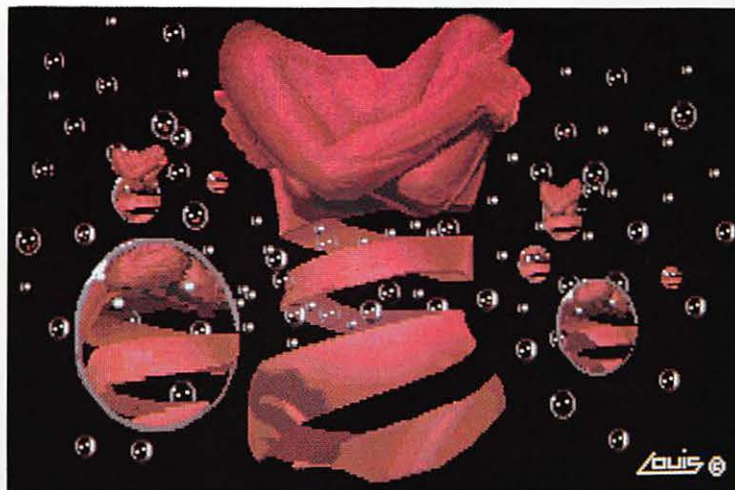


Photon Paint offers color painting tools, plus a color palette.

This is just one capability available in MicroIllusions' new Macintosh version of Photon Paint. This color graphics program also offers perspective tilting, which lets you rotate a 3-D object around any point and shade it by placing a light source.

Photon Paint provides typical paint-program tools as well, including a paint bucket, pencil, spray can, and brush. It also features an arc tool and an eyedropper tool for color matching, similar to those found in SuperMac's PixelPaint. You can select and blend colors for palettes with either Photon Paint's color-blending options or Apple's Color Picker.

Photon Paint runs not only on the Mac II, but also on non-color systems such as the Mac Plus and SE. The program is



With Photon Paint, you can add color graphics or shading to 3-D objects and then create a perspective view.

compatible with all color video boards—from RasterOps' 24-bit board for the Mac II to Orchid Technology's Mac SE board. MicroIllusions is now

developing Mac versions of two more of its Amiga programs: Photon Video/Cell Animator

(continues)

Your Best Stacks



Here's the latest collection of stacks submitted by our readers. Kunihiro Koike, of Yokohama, Japan, submitted five nice MIDI-oriented stacks and two graphics stacks. One of the graphics stacks, Gallery, has a number of digitized Japanese screens. The MIDI stack Funny Day is a short animated cartoon with a basic tune that is very amusing. All of the MIDI stacks contain a number of shareware external commands to allow a HyperCard stack to communicate with a MIDI device. If you are a MIDI user and are interested in interfacing MIDI to HyperCard, you'll find this set of stacks very useful.

The second selection is Bird Anatomy, submitted by Patrick J. Lynch, of the department of biomedical communications at Yale University. This stack is the best educational stack I have

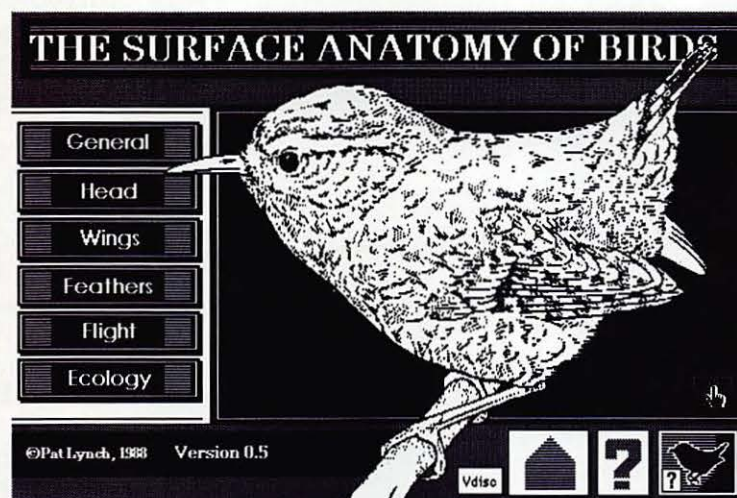
seen to date. It makes outstanding use of the HyperCard interface and is absolutely intuitive. It offers help and an explanation of each button. It has outstanding graphics, and it ties text to those graphics in the manner that Bill Atkinson envisioned for HyperCard when he

wrote it. If you can download only one stack this month, look for this one. It's an example of what all HyperCard authors should strive for in stack design.

My last choice this month is a stack by Dr. Mark Zimmerman; it's called Texas. This stack incorporates 13 external func-

tions that will index any text file. Zimmerman developed it in order to browse through accumulations of information downloaded from various time-sharing services. It offers the C source code for those interested. This highly useful file is a wonderful example of external functions and what external commands can do to extend HyperCard. It is well worth the download time.

Keep those stacks coming c/o News Editor, *Macworld*, for consideration in "Your Best Stacks." We'll pay \$25 for every item printed. Shareware or freeware stacks reviewed here are available on my BBS PhoenixII at 408/253-3926, or PhoenixIII on Portal at 408/725-0561, as well as through the other major commercial services. Both my BBS and Portal can be reached through PCPursuit.—Bob "LaserMan" Murrow



Bird Anatomy is absolutely intuitive. It's the best educational stack our stack reviewer has seen to date.

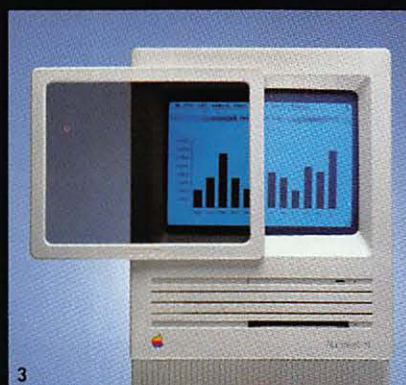


New this April!

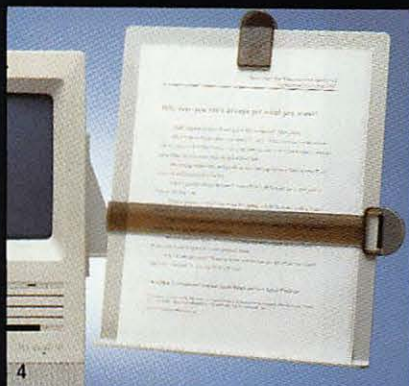
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and Photon Video/Transport Controller.

For more information about the \$249 Photon Paint program, contact MicroIllusions in Granada Hills, California, at 818/360-3715.—*Brita Meng*

New Era in Storage



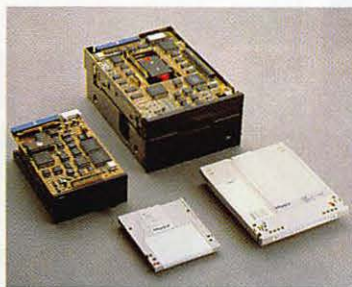
If you've dreamed about virtually unlimited amounts of data storage, you may find that your dreams have come true. Take a look at two new drives from Maxtor Corporation that both use a relatively new technology—removable, optical, erasable media (ROEM)—to hold up to one gigabyte of information.

Maxtor's highest-capacity drive, called Tahiti I, is a 5¼-inch, full-height drive with a removable cartridge that looks like a thick floppy disk. Each side of this cartridge holds up to 512 megabytes of data, which can be accessed as fast as on many hard disks: 30 milliseconds is the average seek time.

If you want something a little smaller, Maxtor's Fiji I is a full-height, 3½-inch drive with a removable cartridge that holds 160MB on a single side. The Fiji I drive's access time is closer to a floppy's—100 milliseconds. Both drives have SCSI interfaces, mean-time-between-failure specifications of 30,000 hours, and an expected media life of over ten years.

Maxtor expects its ROEM drives to be especially popular as network file servers and for applications like CAD/CAM, imaging, document storage, and backup.

Production quantities of both drives are anticipated in September. Retail prices are expected to be at least \$5000 for the Tahiti I and \$2000 for the



One of Maxtor's two new drives holds up to 1 gigabyte of information on a ROEM.

Fiji I. Maxtor is the original equipment manufacturer for the drives, which will be sold under other brand names. For further information, call Maxtor in San Jose, California, at 408/432-1700.

Mac II—Designed Business Cards



A major problem with Macintosh color has been the lack of popularly priced, high-quality color printers. To fill this need, Brilliant Color is now offering a special photographic hard-copy service for Mac II color files.

Here's how it works. You paint any color image you want within a 900-by-540-pixel area on a Mac II, using a program

like PixelPaint that measures the image in pixels. Within this perimeter, leave a minimum margin of 30 pixels, because this area is likely to be cropped. Save your creation as a color PICT file and mail the disk to Brilliant Color, P.O. Box 391776, Mountain View, CA 94039, along with a check for \$15 and your return address. You'll receive 100 photographic business cards of your single image. (It's \$15 for each additional set of 100.) Allow two to three weeks for delivery.

Normally, there is a setup charge of \$9.95 for this product, but as a special offer to *Macworld* readers, Brilliant Color founder Barry Brilliant has waived this setup fee until October 1, 1988.

Brilliant Color also offers a catalog of designs from which cards may be chosen. For \$19.95 per setup and \$15 per 100 cards, Brilliant Color will merge your text with the design. For \$34.95 per setup and \$15 per 100 cards, the company will include your photo as well.

Brilliant Color includes designs from outside artists in its catalog. For consideration, submit your file, both with and without sample text. Outside artists receive a royalty of 5 percent of the setup charge each time a catalog customer chooses an outside design. For further information, call Brilliant Color at 415/969-6309.

These business cards were designed on a Mac II. Design your own, and Brilliant Color will print 100 of each design for \$15.

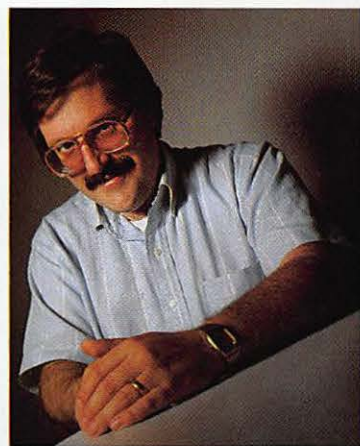


AI Systems from the MS-DOS World



Two established MS-DOS artificial intelligence (AI) systems are now available on the Mac. One, Digitalk's Smalltalk/V, is an integral part of Apple's six-year experimental program to harness the power of computers in an educational environment.

Smalltalk/V, long seen as one of the best-value object-oriented programming environments on the PC, made its Mac appearance in June. The \$99.95 product is a fast and ro-



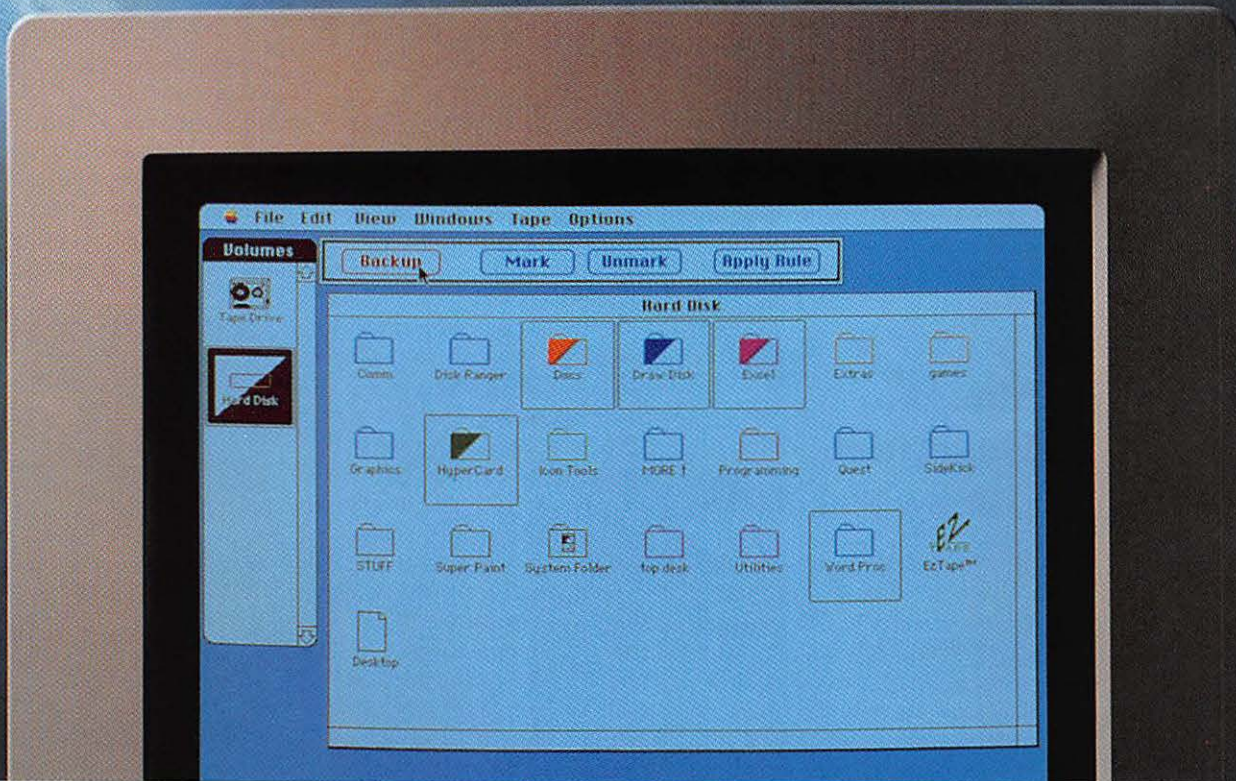
Digitalk's George Bosworth brought Smalltalk/V to the Mac.

bust implementation of Digitalk's Smalltalk/V, and it's gaining increased acceptance in the AI community as a programming environment.

A second AI development system comes from Information Builders, Inc. (IBI). IBI recently acquired a long-established expert-system shell, Level5, and has just begun shipping a Macintosh version. The product, formerly known as Insight II+, is a classic expert-system development environment that has already been adopted as a development tool by hundreds of companies.

(continues)

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Priced at \$685, the program features a Pascal-like approach to expert-systems design and a button-oriented Mac interface.

These and other Mac-based AI products and developments are described in a special report entitled *AI on the Macintosh* (1988), available from Intelligent Systems Analyst, P.O. Box 366, Village Station, New York, NY 10014. The 100-page report costs \$147 and includes vendor lists and product comparisons. For more information about the two development systems, contact Digitalk in Los Angeles at 213/645-1082, and IBI in New York at 212/736-4433.

—Dan Shafer

Star Wars Effects on the Mac



PostScript is the most advanced popular graphics standard now available on the Macintosh. Its line-drawing and font-rendering capabilities made desktop publishing a reality. And soon the kind of graphics tools used to film the special effects of the motion picture *Star Wars* may be coming to a Mac near you.

To begin our journey through the last 20 years of computer graphics, let's start with a typical black-and-white, PostScript-like page and add features such as color, three-dimensional objects, shaded surfaces, multiple lights, reflectivity, animation, and interaction (between the screen and your commands, for instance). Any one of these capabilities represents a major technical triumph that has taken hundreds of people, and millions of dollars, to make a commercial reality.

This state-of-the-art technology is now coming to the Macintosh via Pixar—a spin-off company from Lucasfilm, the



This Pixar-generated image contains over 80,000 individual elements. It was created using a new graphics standard called RenderMan, which could eventually come to the Mac.

creator of *Star Wars* and *The Empire Strikes Back*. Pixar is now largely owned by Steve Jobs, one of the cofounders of Apple and current president of NeXT.

So what's a Mac II doing in the specialized and expensive world of animated, 3-D computer graphics? Actually, it's expected to take the place of a much more expensive workstation, like a Sun or an Apollo, that's normally used to control image processing on a \$29,500 Pixar computer. Add the appropriate software and video hardware, and you have the basic makings of a very advanced graphics-modeling system that can create spectacular video animations of complicated 3-D objects.

Pixar is not only bringing these capabilities to the Macintosh, it's offering a graphics rendering standard that defines all these features in a proposal called RenderMan, which has been endorsed by companies such as Apollo Computer, Intelligent Light, MIPS Software Development, NeXT, Prime Computer, Stellar Systems, Sun Microsystems, and Symbolics. Pixar hopes such a standard will have the same success in popularizing computer graphics as PostScript has had in promoting DTP.

Of course, Pixar's systems are already far less costly than

they were a few years ago, when it cost over a million dollars to generate photo-realistic graphics. In a few more years, the price tag could be under \$10,000. For more information, and to obtain your copy of RenderMan, call Pixar in San Rafael, California, at 415/258-8100.

Readers' Views about Apple's Lawsuit



This month's reader survey focuses on Apple's lawsuit against Microsoft and Hewlett-Packard for "copyright infringement and unfair competition." We sent surveys to 1000 randomly selected *Macworld* readers. Of the 450 responses received, 50 percent agreed with Apple's decision to sue, 30.7 percent disagreed, and 19.3 percent were undecided.

Interestingly, although half the respondents agreed with Apple's decision to sue, only 22.4 percent expected Apple to win; 30.9 percent expected Microsoft and Hewlett-Packard to win.

We also asked respondents to comment on the lawsuit, and

we received hundreds of observations. Here's a sampling.

"As one who has used both a Macintosh and Microsoft Windows on an IBM PC, I think Macintosh has a good case against Microsoft."

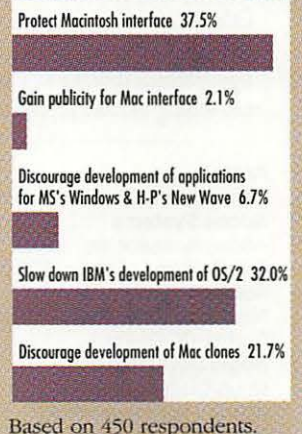
"I'm surprised it took so long to reach this stage. It's only a matter of time before IBM and Apple wage the battle for hegemony reminiscent of VHS and Beta in the VCR industry. Regrettably, the Macintosh is the likely casualty."

"While I believe Apple has a very thin case, the act of suing will undoubtedly help its business by calling attention to the Mac's desirable features and by slowing the competition. The risk is to lose outright—then direct copying could ensue, to Apple's severe disadvantage."

"New developments in science are for all the world and shouldn't be restricted in usage. What would have happened if Edison had restricted electricity?"

"It may be futile closing the barn doors after the windows are out." □

Which one of the following reasons do you think is Apple's real reason for filing the lawsuit?



Readers express divergent views about Apple's real reason for suing Microsoft and Hewlett-Packard.

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All software is not copy-protected unless specified copy-protected (CP).

Aatrix Software

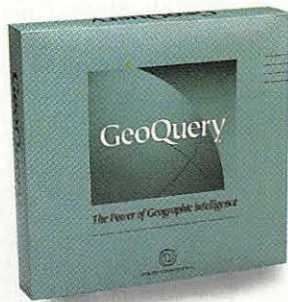
Aatrix Payroll \$115.
Aatrix Payroll PLUS 189.

Aba Software

"Draw it again, Sam" (paint program) 89.

Access Technology

MindWrite 2.0 95.
MindWrite Express (WP file exchange) ... 149.
Trapeze (spreadsheet & graphics) 159.



Odesta

GeoQuery—Information based on location needs a geographical database for intuitive searches and sorting. Includes popular templates \$295.

Acius

4th Dimension (relational database) 529.

Adobe Systems

Adobe Illustrator '88 325.
The Collector's Edition (EPS clip-art) 79.
Adobe Type Libraries call
Newsletters (Century Old Style, ITC Franklin Gothic, ITC Galliard) 269.

Aegis Development

Doug Clapp's Word Tools 42.

Affinity Microsystems

Affinifile (DA filer) 46.
Tempo 1.2 (macros for your Mac!) 52.
Tempo II (power user's macro utility) 89.

Allan Bonadio Associates

Expressionist 2.0 (equation processor) ... 79.

ALSoft

DiskExpress (maximize disk performance) 26.
Font/DA Juggler Plus (w/sound utility) 32.

Altsys

FONtastic Plus 2.0 (advanced font editor) 54.
Fontographer (LaserWriter font editor) ... 239.

Ars Nova

Practica Musica 79.



Symantec

MacSQZ!—Squeeze your spreadsheets and stop pushing the limits of your hard disk. Works automatically as you open & save \$49.

Ashton-Tate

FullPaint (expanded paint program) 69.
FullWrite (WP w/page layout capabilities) 275.
dBASE Mac (relational, req. MacPlus) 295.

Berkeley System Design

Stepping Out II (screen extender) 54.

Blyth

Omnis 3 Plus/Express (database) 275.
Omnis 3 Plus/Express (2-5 users) 489.

Bogas Productions

Studio Session (music creation) 49.
Country, Heavy Metal, or String Quartet ... 15.

Borland International

Sidekick (includes MacPlan) 65.
Turbo Pascal (HFS compatible) 65.
Eureka: The Solver 129.
Reflex Plus (info management tool) 165.

BrainPower

StatView 512+ (full-featured) 175.
DataScan (converts charts to numbers) 119.
DesignScope (electronic circuit design) ... 128.
MathView Professional (num. analysis) ... 145.
ArchiText (search, link & manage text) 195.

Bravo Technologies

MacCalc (easy to use spreadsheet) 79.

Bright Star Technology

Alphabet Blocks (teaches phonetic sounds) 32.
Talking Tiles (preschool phonetics) 79.
HyperAnimator (adds personalized speech) 89.

Broderbund ... CP

Jam Session (create your own tunes) 30.
Print Shop (create cards and memos) 36.
Geometry or Physics 60.

CAMDE

Nutri-Cal Plus (full-featured program) ... 175.

CasadyWare

Fluent Fonts (two-disk set) 27.
Fluent Laser Fonts (Vols. 1-19) each 45.

CE Software

Calendar Maker (create custom calendars) 28.
Desktop (powerful DA Finder) 28.
QuickKeys (reduce mouse movements) ... 54.
QuickMail (10 users) 179.

Challenger Software

Mac3D (3D graphics, CAD features) 119.

Chang Labs

Rags to Riches 3-Pak (GL, AR, & AP) 289.
C.A.T. (contacts, activities, time) 239.

Inventory Control or Professional Billing ... \$239.
Professional or Retail Business 3 Pak. 359.

Cricket Software

Pict-O-Graph (color on the Mac II) 105.
Cricket Graph (multiple windows) 119.
Cricket Draw (advanced draw capabilities) 169.
Cricket Presents (MacPlus, SE & II) 289.

DataViz

MacLink Plus (transfer Mac/IBM data) 145.

Davidson ... CP

Math Blaster! (grades 1-6) 27.

Deneba Software

Merriam-Webster's Thesaurus 36.
Comment 2.0 (electronic Post-It notes) 54.
Canvas DA (contains 80% of Canvas) 54.
Canvas 1.0 (free upgrade to 2.0) 109.
Coach (interactive spell checker) 54.
Coach Professional 109.

DreamMaker

MacGallery (HyperCard or MacPaint format) 29.

Dubl-Click Software

Calculator Construction Set 36.
World-Class Fonts! (1 & 2 thru 5 & 6) each 45.
WetPaint Clip Art (1 & 2 thru 15 & 16) each 45.

Electronic Arts

Thunder! (Batteries Included spell checker) 30.
Disk Tools Plus (8 DAs plus tools) 31.
Deluxe Music Construction Set 61.

Enzan-Hoshigumi USA

MacCalligraphy (create unique designs) ... 109.
Japanese Clip Art call

Farallon Computing

MacRecorder™ Sound System 145.

Fifth Generation Systems

Suitcase (font and DA utility) 37.
PowerStation (alternative to Finder) 37.
FastBack Mac (powerful backup utility) 54.

1st Byte ... CP

First Shapes, KidTalk, MathTalk Fractions, MathTalk, SmoothTalker, Speller Bee ... each 32.

Foundation Publishing

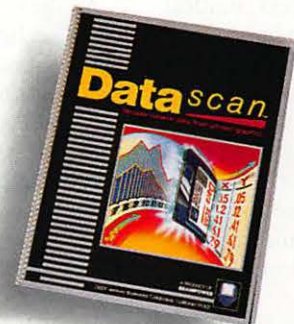
Comic People (create your own characters) 25.
Comic Strip Factory (create cartoons) 45.

Freesoft

Red Ryder 10.3 (communications) 55.

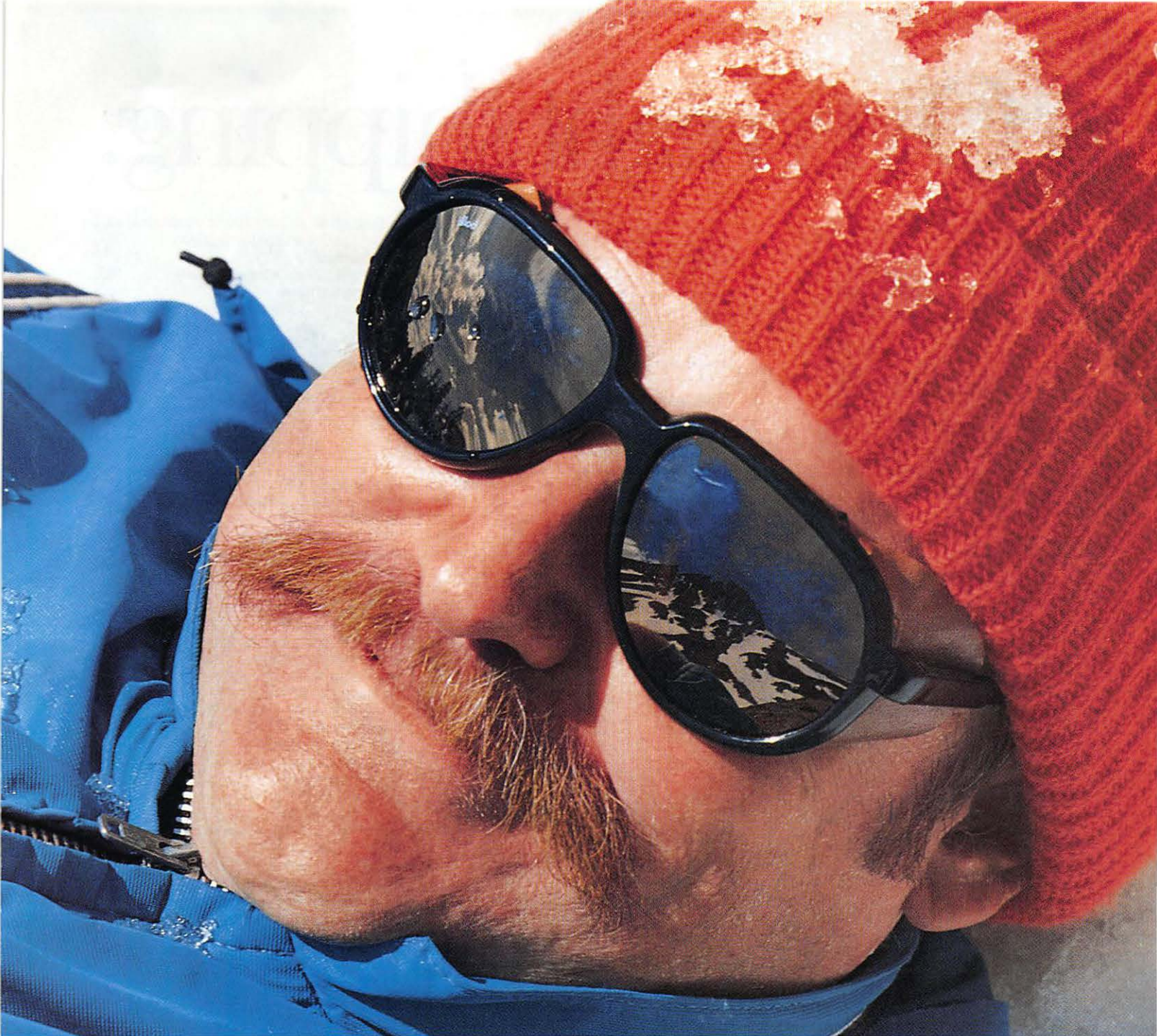
FWB Software

Hard Disk Partition 45.
Hard Disk Util (program backup) 54.



BrainPower

DataScan—Analyze those graphs and gets to the real info. DataScan converts your charts to easily read numeric data \$119.



"At 8000 feet, you get used to waiting."

"Gentlemen,

"I just wanted to drop you a note expressing my delight in your speedy service.

"You see, Ouray, Colorado is well known for jeeping, hot springs, mayor C.W. McCall of "Convoy" fame, and some great scenes from the movie "True Grit." But here at 8000 feet, where the snow

in the hills can still be deep in May, and it's a 40 minute drive (one way) to the nearest supermarket, you get used to waiting for mail order deliveries. And waiting. And waiting. Not with you guys. *In fact, this is the only time I have ever received a package in 24 hours."*

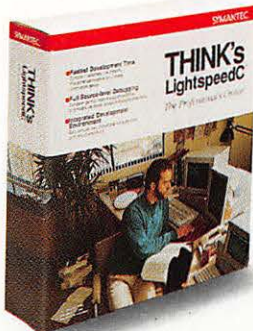
Robert R. Wier
Ouray, CO

MacConnectionTM

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=Overnight shipping.



Symantec
LightSpeed C 3.0—The ultimate development environment. Features extremely fast compiler, faster linker, multi-window text editor, & powerful source-level debugger. \$95.

Simon & Schuster	
Typing Tutor IV (<i>typing instruction</i>)	35.
SmethersBarnes	
Prototyper (<i>design & edit prototypes</i>)	75.
SoftStyle	
Epstart (<i>Epson printer driver, CP</i>)	27.
Laserstart (<i>Hewlett-Packard Laserjet, CP</i>)	58.
Printworks for the Mac (<i>dot matrix</i>)	43.
Printworks for the Mac (<i>daisywheel</i>)	56.
Printworks for the Mac (<i>non-PostScript™</i>)	85.
SoftView	
MacInUse (<i>time-use manager</i>)	42.
TaxView Planner 1987-1991	49.
FormSet Business Forms Edition	59.
Software Discoveries	
Merge Write (<i>MacWrite mail merge</i>)	35.
Record Holder Plus (<i>data manager</i>)	45.
Software Ventures	
Microphone 1.1 (<i>includes Glue™</i>)	119.
Microphone II (<i>MultiFinder compatible</i>)	229.
Solutions, Inc.	
SmartScrap & The Clipper	35.
SuperGlue (<i>total graphic integration</i>)	52.
The Curator (<i>access your artwork</i>)	79.
Springboard ... CP	
Art a la Mac Volume 1 or 2	23.
Early Games (<i>counting, shapes, ages 2-6</i>)	28.
Certificate Maker (<i>over 200 certificates!</i>)	24.
Certificate Maker Library Vol. 1	18.
SuperMac Software	
SuperSpool 4.0 (<i>very fast, top-rated</i>)	54.
SuperLaserSpool 2.0	82.
Multi-User SuperLaserSpool	199.
Diskfit (<i>backup & restore utility</i>)	54.
Network Diskfit (<i>automatic back up</i>)	199.
Sentinel (<i>encryption</i>)	155.
PixelPaint (<i>color Paint program</i>)	259.
Survivor Software	
MacMoney (<i>personal finance</i>)	62.
Symantec	
MacSQZ! (<i>use w/Microsoft Excel</i>)	49.
SUM (<i>comprehensive disk utilities package</i>)	59.
More (<i>Living Videotext outliner</i>)	175.
HFS Navigator (<i>search for buried files</i>)	34.
Laserspeed (<i>LaserWriter utility</i>)	55.
Lightspeed Pascal (<i>great debugger</i>)	65.
Lightspeed C (<i>top-rated C Compiler</i>)	95.
CAPP's for Lightspeed C or Pascal	49.

InBox Starter Kit (<i>CP</i>)	\$199.
InBox Personal Connection (<i>Mac or PC</i>)	call
Symmetry	
Acta (<i>outline/writing desk accessory</i>)	36.
HyperDA (<i>view HyperCard stacks</i>)	38.
PictureBase (<i>clip art manager, 512k</i>)	58.
3G Graphics	
Images with Impact (<i>PostScript™ clip-art</i>)	59.
Telegraphics	
HyperTutor (<i>HyperTalk tutorial</i>)	30.
Think Educational ... CP	
MacEdge II or Mind Over Mac	28.
T/Maker	
ClickArt Personal Graphics, Effects, Publications, Letters Vol. 1 or 2, Holidays, Business Images each	28.
Christian Images	35.
Bombay, Plymouth, or Seville Laser font	45.
EPS Illustrations (<i>over 3 Meg's worth</i>)	75.
Write Now 2.0 (<i>WP w/100,000 spell checker</i>)	109.
TML Systems	
TML Pascal II (<i>new & improved compiler</i>)	79.
TOPS	
TOPS Teleconnector (<i>DIN8 or DB9</i>)	39.
TOPS (<i>file-server/LAN software</i>)	119.



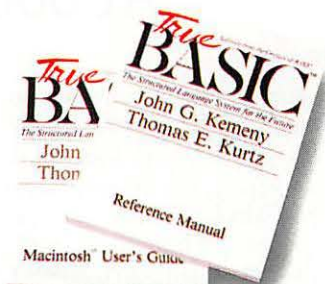
TML Systems
TML Pascal II—Create any type of Macintosh program. Native code Pascal compiler includes complete Macintosh Programmer's Workshop software & documentation \$79.

TOPS Repeater	132.
Traveling Software	
LAP-LINK Mac	85.
True BASIC	
LANGUAGE & TOOLKITS	
True BASIC 2.0 (<i>interpreter & compiler</i>)	59.
3D Graphics, Sorting & Searching, Advanced String, Business Graphics, Scientific Graphics or Mathematicians Toolkit each	49.
EDUCATIONAL SOFTWARE	
Algebra I or II, Pre-Calculus, Trigonometry, Discrete Math, Probability, Calculus, Arithmetic & MacFunction each	35.
TrueSTAT (<i>statistics</i>)	49.
Unicorn ... CP	
Animal Kingdom (<i>ages 6-12</i>)	27.
Math Wizard (<i>math games, ages 5-10</i>)	27.
Decimal Dungeon (<i>ages 9 & up, 1-2 players</i>)	27.
Fraction Action (<i>arcade style format</i>)	27.
Mac Robots (<i>preschool to age 6</i>)	27.
Read-A-Rama (<i>reading, ages 5-8</i>)	32.
William & Macias	
DiskFinder (<i>DA disk catalog</i>)	29.

myDiskLabeler w/Color (<i>req. ImageWriter II</i>) \$31.	
myDiskLabeler w/LaserWriter option	34.
WordPerfect	
WordPerfect Mac (<i>word processor</i>)	185.
Working Software	
Lookup (<i>90,000 word dictionary</i>)	29.
Findswell (<i>locate documents fast</i>)	29.
Spellswell (<i>spelling checker</i>)	42.
Spellswell Legal or Medical Dictionary	54.
Zedcor	
ZBasic (<i>fast basic compiler</i>)	65.
DeskPaint 2.0 (<i>DA paint product</i>)	75.

GAMES

Accolade ... CP	
Hardball (<i>baseball simulation</i>)	23.
Activision ... CP	
Shanghai (<i>Mah Jongg strategy</i>)	24.
Avalon Hill ... CP	
MacPro Football	28.
Baudville ... CP	
Guitar Wizard or Rainy Day Games	22.
Blue Chip ... CP	
Millionaire (<i>stock market simulation</i>)	35.
Broderbund Software ... CP	
Ancient Art of War (<i>military strategy</i>)	27.
Bullseye ... CP	
Ferrari Grand Prix or Fokker TriPlane	32.
Electronic Arts ... CP	
Ogre (<i>tank simulation</i>)	20.
Patton vs Rommel or Scrabble	27.
Chessmaster 2000	28.
Epyx ... CP	
Sub Battle Simulator	24.
Winter Games (<i>Olympic events</i>)	24.
Greene, Inc. ... CP	
Crystal Quest (<i>top-rated color arcade</i>)	24.
Infinity Software ... CP	
Go or Grand Slam Tennis	27.
Infocom ... CP	
Leather Goddesses	24.
Beyond Zork	30.
Classic Mystery Library: Moonmist, Suspect, & Witness	36.
Science Fiction Classics: Hitchhiker's, Planetfall, & A Mind Forever Voyaging	36.
Zork Trilogy	42.



True BASIC
True BASIC 2.0—By the people who know what BASIC should be! Kemeny & Kurtz—original authors of the BASIC language. New version includes Runtime Library. \$59.

MacConnection + \$3

Great Wave Software

TimeMasters (learn about time, ages 4+)	\$22.
KidsTime (educational, ages 3-8)	26.
American Discovery (U.S. facts & fun)	39.
Crystal Paint (graphic symmetries)	41.
ConcertWare+ (music composition)	39.
ConcertWare+ MIDI	79.

Greene, Inc.

QuickDEX (DA database)	32.
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Ideaform

MacLabeler or DiskQuick	27.
HyperBook Maker (print stacks into book)	31.

Imagine

Smart Alarms (DA reminder system)	35.
Multi-user Appointment Diary	85.

Infosphere ... CP

LaserServe (network software)	62.
CornServe (modem sharer)	124.
MacServe (network software)	158.

Innovative Data Design

MacDraft (object-oriented graphics)	149.
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Intuit

Quicken (personal accounting)	35.
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Kent Marsh Ltd.

The NightWatch or MacSafe	89.
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LaserWare

LaserPaint Color II	379.
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Layered

Notes for...Excel, Works or Word	40.
Insight Expert AR, GL, or AP	479.
Insight Expert Inventory or Time Billing	479.

Learning Company ... CP

Reader Rabbit (ages 4-7)	33.
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Letraset

Image Studio or Ready,Set,Go!4	279.
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Linguist's Software

SuperFrench/German/Spanish	39.
MacKanji or MacKorean	59.
MacHebrew Scriptures	79.
MacChinese (supplements available)	79.
LaserFrench/German/Spanish	79.
LaserGreek, LaserHebrew, or LaserTech	79.

Lundeen & Associates

WorksPlus Spell (spell checker for Works)	46.
WorksPlus Command (macros for Works)	60.

MacroMind

VideoWorks II HyperCard Driver	62.
VideoWorks II Accelerator	62.

VideoWorks II (animation tool)	\$118.
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MacroPac International

101 Macros for Excel	44.
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Manhattan Graphics

Ready,Set,Show (presentations)	289.
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MECA

Managing Your Money (finance)	129.
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Mediagenics (formerly Activision)

Business Class or City to City	30.
Focal Point or Reports	59.

Microlytics

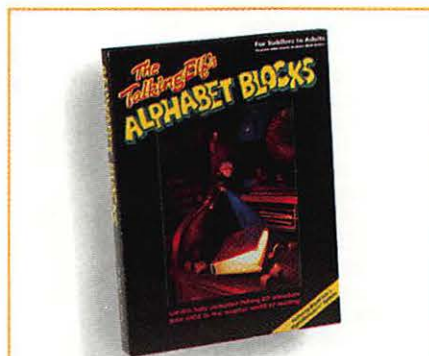
Word Finder (synonym finder)	35.
GOfer (text finder)	45.

Microseeds Publishing

Redux (fast & easy backup utility)	65.
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Microsoft

Basic Interpreter 3.0	62.
Microsoft Write 1.0 (w/spell checker)	113.
Multiplan 1.1 or File 1.05	119.
Basic Compiler 1.0	125.
Fortran 2.2 (compiler)	189.
Works 1.1 (integrated tool)	189.
Microsoft Mail (up to four users)	195.
Microsoft Mail (up to 10 users)	325.



BrightStar Technology

Alphabet Blocks—Let this fully animated talking elf introduce your child to the magical world of reading. \$32.

Excel 1.5 (power spreadsheet)	249.
Word 3.02 (powerful word processor)	249.
PowerPoint 2.0 (presentations)	249.

Migent

In House Accountant (small business)	119.
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Miles Computing

Orchestra of Fonts Vol. 4	special 19.
Mac the Ripper Vol. 3 (req. Paint program)	27.
Peoples, Places & Things Vol. 5	27.

Mindscape

The Perfect Score: SAT (CP)	46.
ComicWorks (create your own comics)	47.
GraphicWorks (newsletters & posters)	84.

Monogram

Dollars & Sense (home, small business)	81.
Business Sense (full-featured)	279.

Nantucket

McMax (dBASE III compatible)	175.
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Nashoba Systems

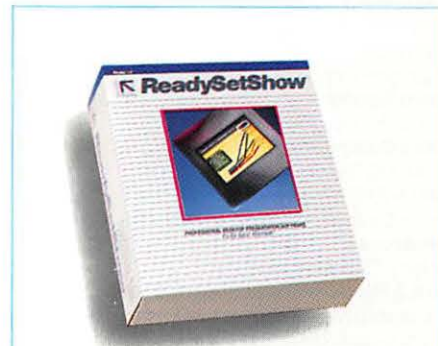
FileMaker 4 (feature-packed database)	175.
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Nolo Press

WillMaker 3.0 (prepare your own will)	35.
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North Edge Software

Timeslips III (time & expense tracking)	119.
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Manhattan Graphics

ReadySetShow—Combines the utility of text, graphics, charting, and presentation management software in a single, easy-to-use package. \$289.

Odesta

GeoQuery (geographical database)	295.
Double Helix II (relational, custom menus)	339.

Olduvai Software

DA-Switcher (unlimited desk accessories)	25.
Post ART (clip art, 3 disk set)	35.
Icon-It! (create custom icon bars)	39.
FontShare (share PostScript™ fonts)	149.
Read-It!TS (OCR software for Thunderscan)	79.
Read-It! (300 dpi OCR software)	199.

OWL International

Guide 2.0 (hypertext, free-form info)	119.
Guide Envelope System	99.

Palantir

MacType (typing instruction)	31.
inTalk (communication to emulation)	119.

Passport Designs ... CP

Mastertracks Jr.	109.
Mastertracks Pro (music editor)	259.
Clicktracks	225.

Peripherals Computers & Supplies

KaleidaGraph (data analysis & graphics)	125.
VersaTerm (terminal emulator/comm.)	69.
VersaTerm-PRO (powerful terminal prog.)	199.

Personal Computer Peripherals

HFS Backup	28.
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Postcraft International

Laser FX (PostScript™ fonts special effects)	115.
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ProVUE Development

OverVUE (power-packed database)	149.
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Rubicon Publishing ... CP

Dinner At Eight-Encore Edition Bundle	51.
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Satori

BulkMailer 3.2 (mailing lists)	79.
BulkMailer Plus (up to 90,000 names)	195.
Components GL (customizable)	389.
Legal Billing (attorneys to accountants)	369.
Legal Billing II (full trust accounting)	539.
Project Billing (architects to engineers)	439.

Sensible Software

Sensible Speller	45.
Sensible Grammar	55.

Silicon Beach Software

Silicon Press (printer utility, 512k)	41.
World Builder (program creator)	41.
SuperPaint 1.1 (graphics program)	79.
Super3D (3D modeling & animation)	159.
Digital Darkroom (image-enhancement)	159.



Kensington ... 1 year

New Turbo Mouse—Twice the speed in half the space. 200 CPI precision. Advanced button features. Specify MacPlus, SE, or II. \$109.

It's Mac to school

MacroMind

Mazewars+ (play via modem or network) \$31.

Microsoft ... CP

Flight Simulator (the Mac takes flight) ... 32.

Micro Sports

MSFL Pro League Football ... 32.

Miles Computing ... CP

Down Hill Racer (3D ski simulation) ... 24.

Harrier Strike Mission II ... 27.

Fool's Errand (puzzles, mazes and more) ... 27.

Mindscape ... CP

Colony (3-D adventure) ... 30.

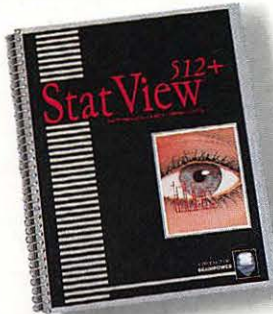
Trust & Betrayal: The Legacy of Siboot,

Crossword Magic, Balance of Power, Deja Vu,

Shadowgate, Uninvited ... each 30.

PBI Software ... CP

Strategic Conquest (multi-user) ... 35.



BrainPower

StatView 512+—The professional's data analysis package. Includes descriptive and comparative statistics, multi-variate and factor analyses, graphics and more ... \$175.

Primera Software ... CP

Smash Hit Racquetball II ... 22.

Psion ... CP

Psion Chess (3D and multi-lingual) ... 31.

Sierra On-Line ... CP

Leisure Suit Larry (swinging single life) ... 23.

King's Quest I, II, or III ... 30.

Space Quest (save the universe!) ... 30.

Silicon Beach Software

Airborne! (CP, digitized sounds) ... 20.

Enchanted Scepters (CP, over 200 scenes) ... 21.

Dark Castle (top-rated arcade action) ... 27.

Beyond Dark Castle (super sequel) ... 27.

Apache Strike (3D helicopter action) ... 27.

Simon & Schuster ... CP

Star Trek—The Kobayashi Adventure ... 24.

Promethian Prophecy ... 24.

Sir-Tech ... CP

Mac Wizardry (high-rated fantasy) ... \$35.

SPHERE, Inc.

Tetris (the Soviet Challenge) ... 26.

PT-109, GATO, Orbitor, or Falcon ... 26.

XOR

Pro Challenge (football) ... 30.

NFL Challenge (with illustrated handbook) ... 64.

HARDWARE

Manufacturer's minimum limited warranty period is listed after each company name. Some products in their line may have longer warranty periods.

1 Meg SIMMs ... call for availability.

Abaton ... lifetime

ProPoint ADB (Mac SE or II) ... 99.

Asher Engineering ... lifetime

Turbo Trackball (Mac SE or II) ... 79.

AST Research ... 6 months

Mac 286 (MS-DOS on your Mac II) ... call

AST TurboScan (300 dpi scanner) ... call

AST TurboLaser P/S ... call

Curtis Manufacturing ... lifetime

SURGE SUPPRESSORS

Safestrip (6 outlets) ... 21.

Diamond (6 outlets) ... 32.

Emerald (6 outlets; 6 ft cord) ... 36.

Sapphire (3 outlets; EMI/RFI filtered) ... 47.

Ruby (6 outlets; EMI/RFI filtered; 6 ft cord) ... 59.

Cutting Edge

CE 105ADB Keyboard ... 135.

800k Disk Drive ... 175.

The Wedge XL 30+ SCSI Hard Drive ... 629.

The Wedge XL 45+ SCSI Hard Drive ... 829.

Datadesk ... 2 years

MAC-101 (specify Mac) ... 139.

HyperDialer (auto-dial for Mac & HyperCard) ... 26.

Dove Computer ... 90 days

SCSI Interface/Port ... 85.

MacSnap 524 or 524E ... 195.

MacSnap 524S (512E to 1 Meg w/SCSI) ... 219.

MacSnap 548 or 548E ... 399.

MacSnap 548S (512E to 2 Meg w/SCSI) ... 479.

MacSnap 2SE (Mac SE to 2 Meg) ... 299.

MacSnap Plus 2 (MacPlus to 2 Meg) ... 299.

MacSnap Plus 2H (MacPlus to 2.5 Meg) ... call

MacSnap Plus 4H (Plus/II to 4 Meg) ... call

68020 Accelerator Boards for Mac SE ... call

1024 Option (1 Meg accelerator or Mac II

memory expansion) ... 299.

Math Kit (math co-processor chip set) ... 225.

Ergotron ... 1 year

The Muzzle (virus protector!) ... 65.

Mac II Workstation ... call

Mouse Cleaner 360° ... \$15.

MacTilt or MacTilt SE ... 68.

MacTilt (for large monitor) ... 85.

Farallon Computing ... 1 year

PhoneNET-AppleTalk 120 ... 9.

PhoneNET PLUS (DB-9 or DIN-8) ... 36.

PhoneNET StarController™ ... 1395.

PhoneNET Punch Down Block Wire Kit ... 69.

TrafficWatch (monitor network) ... 159.

FWB Software ... 1 year

HammerDrives (91-300 Meg) ... call

Hayes ... 2 years

Smartcom II (communications) ... 88.

Smartmodem 1200 ... 299.

Smartmodem 2400 ... 449.

MacPlus/SE/II 1200 or 2400 Package ... call

Kensington ... 1 year

Mouseway (mouse pad) ... 8.

Mouse Pocket (ADB) ... 8.

Mac Plus/Mac SE Cover ... 9.

Printer Stand ... 16.

Disk Drive Cleaning Kit ... 20.

Macintosh II Stand ... 20.

Universal Copy Stand ... 22.

Extra Long ADB Keyboard Cable ... 25.

Anti-glare Filter (for MacPlus or SE) ... 33.

Macintosh II Monitor Extension Cable ... 33.

Apple Security System ... 34.

SuperBase (tilt/swivel & shelf) ... 34.

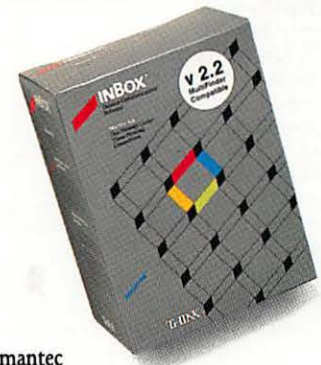
Printer Muffler (80 column) ... 43.

Printer Muffler (132 column) ... 58.

Printer Muffler Stand (80 column) ... 25.

MasterPiece 400 ... 64.

MasterPiece Mac II ... 105.



Symantec

InBox—end paper clutter. Send messages through your AppleTalk network! Includes message center and three personal connections ... \$199.
InBox Personal Connections—each add'l Mac. \$75.

1-800/Mac&Lisa 860C

MacConnection™



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All items subject to availability. Prices subject to change without notice.

*Defective software replaced immediately. Defective hardware replaced or repaired at our discretion.

and Mac to work.

A-B Box (mini DIN-8)	\$64.
System Saver Mac	64.
System Saver SE	64.
Turbo Mouse (specify MacPlus, SE or II) ..	109.
Koala Technologies ... 90 days	
MacVision 1.4 (digitizer)	169.
Kraft Systems ... 1 year	
3-Button QuickStick (specify Mac type) ...	39.
Kurta ... lifetime	
IS ADB Tablet (graphics tablet)	259.
Cordless 4 Button Cursor	99.
Migent ... 1 year	
Pocket Modem (ext. 300/1200 baud)	115.
MSC Technologies ... lifetime	
A+ Mouse (optical mouse)	65.
A+ Mouse ADB (for Mac SE & II)	85.
Nutmeg Systems ... 90 days	
Nutmeg 15" Monitor (for MacPlus or SE) ..	1295.
Nutmeg 15" Monitor (for Mac II)	1395.
Nutmeg 19" Plus (for MacPlus or SE) ..	1495.
Nutmeg 19" Plus (for Mac II)	1595.
Nuvotech	
TurboNet/AppleTalk connector cable	6.
TurboNet ST (self-terminating)	27.
Orange Micro ... 1 year	
Grappler (universal parallel interface) ..	79.
Passport Designs ... 90 days	
Passport MIDI Interface	95.
MIDI Transport (2 MIDI in, 5 MIDI out) ...	339.
Personal Computer Peripherals ... 2 years	
HD-WSI (connects Apple HD 20 to SCSI) ..	269.
MacBottom HD 21 Meg SCSI	749.
MacBottom HD 21 Meg SCSI w/Modem ..	915.
MacBottom HD 32 Meg SCSI	899.
MacBottom HD 32 Meg SCSI w/Modem ..	1045.
MacBottom HD 45 Meg SCSI	1149.
MacBottom HD 45 Meg SCSI w/Modem ..	1295.
MacBottom HD 70 Meg SCSI	1395.
MacBottom IHD-144 Meg (for Mac II; 1 yr.)	2189.
Practical Peripherals ... 5 years	
1200 Baud External Modem	109.
2400 Baud External Modem	189.
Shiva	
NetSerial X232	309.
NetModem V1200	359.
NetModem V2400	479.
SoftStyle ... 90 days	
MacEnhancer (for plotters to printers) ...	159.

Summagraphics ... 90 days	
MacTablet 12" x 12"	\$379.
Thunderware ... 90 days	
ThunderScan 4.0 with PowerPort	199.
Mac II Power Accessory	42.

DISKS

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Sony 3 1/2" DS/DD Disks (box of 10)	18.
Fuji 3 1/2" DS/DD Disks (box of 10)	19.
Verbatim 3 1/2" DS/DD Disks (box of 10) ..	19.
MAXELL 3 1/2" DS/DD Disks (box of 10) ...	20.

INFORMATION SERVICES

CompuServe	
CompuServe Information Service	24.
Grolier's Online Encyclopedia	32.
CompuServe Navigator	45.
Dow Jones	
Dow Jones News/Retrieval Membership Kit 24.	



Dove ... 90 days
SE Accelerator Board (MSE 1)—Bring the power of the Mac II to your SE. Uses the 68020 processor with options for a math co-processor and an extra Meg of memory **\$585.**

ACCESSORIES

Bantam Books	
The Complete HyperCard Handbook	24.
Clean Image Ribbon Co.	
Clean Image Ribbon Kit	12.
Computer Coverup	
External 800k Drive Cover	4.
ImageWriter II Cover	8.
Mac Plus or Mac SE Cover Set	10.
Goldstein & Blair	
The Macintosh Bible (incl. 2 free updates) ..	16.
I/O Design	
MacLuggage HDware (hard drive cases) ..	54.
MacLuggage Imageware II	49.
MacLuggage Macinware SE	79.
Kalmar Designs	
Teakwood Roll-top Case (holds 90 disks) ..	20.
Moustrak	
Available in a variety of colors.	
Moustrak Pad (standard 7" x 9")	8.
Moustrak Pad (large 9" x 11")	9.
Moustrak Pad L/F (9" x 11")	10.
Moustrak Pad L/F (Designer Series)	12.



Personal Computer Peripherals ... 2 years
MacBottom—High performance hard drives (21, 32, 45, or 70 Meg) with optional built-in modem. Formatted & ready to plug in. Includes spooler, back-up, & other utilities. ... **see listing**

Ribbons

ImageWriter Ribbons	4.
Available colors: black, blue, brown, green, orange, purple, red, yellow, silver and gold.	
Rainbow Pack (6 single color ribbons)	20.
Multi 4-Color Ribbon (req. ImageWriter II) ..	9.
ImageWriter LQ Ribbons	17.

Sopris Softworks

Quality "MacAttire" nylon dust covers	7-17.
High Trek ImageWriter II carry case	49.
High Trek MacPlus carry case	59.
High Trek Mac SE & ext. kybd. carry case ..	69.
Targus (Canada) Ltd.	
ImageWriter II Carry Case (black)	49.
MacPlus Carry Case (black)	59.
Mac SE Carry Case (black)	69.

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- APO/FPO orders shipped 1st Class Mail, charged by weight.
- Allow 1 week for personal and company checks to clear.
- COD max. \$1000. Cash or certified check.
- 120 day limited warranty on all products. *
- To order, call us anytime Monday through Friday 9:00 to 9:00 EST, or Saturday 9:00 to 5:30 EST. You can call our business offices at 603/446-7711 Monday through Friday 9:00 to 5:30 EST.

SHIPPING

Continental US: Barring massive computer failures and other natural or unnatural catastrophes, all non-C.O.D. orders phoned into MacConnection by 8 PM EST will ship Airborne the same night for next day delivery, except for those within UPS Ground Zone 1 (which is also an overnight service). The total freight charge on any order placed with MacConnection is now \$3. Backorders will also ship Airborne overnight at no additional charge. Some areas require an additional day delivery.

Hawaii, Alaska and Outside Continental US: Call 603/446-7711 for information.



Kraft Systems ... 1 year
New ADB Joystick—Zero in on even the fastest moving targets. Bring faster action & improved scoring to your favorite Mac SE or II games **\$39.**

Coming Soon to a Monitor Near You

by David Ushijima

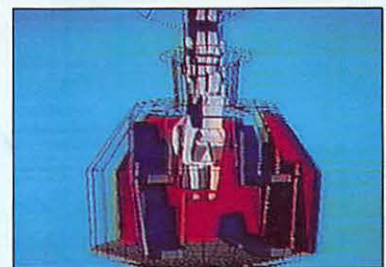
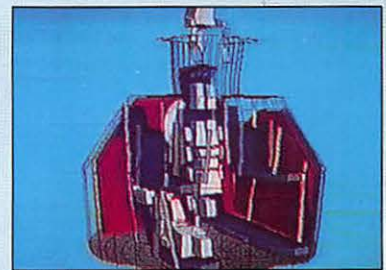
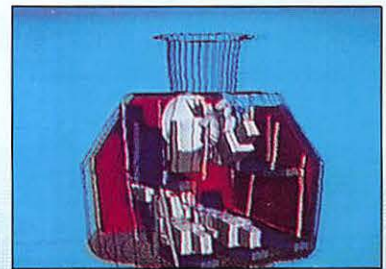
*Record three-
dimensional
simulations,
business
presentations,
or new-wave
animation*



ELISABET ZEILON

Television is news and movies. Macintosh is graphics and page layouts, scrolling columns instead of talking heads. The ability to combine these two mediums by recording computer-generated graphics on videotape promises to make video a viable solution for publishing and presentations. But while computer graphics has advanced rapidly in the past 10 years, television technology has remained relatively inert for the past 30. In order for video publishing to succeed, affordable products must bridge the gap between the television studio and the desktop.

Existing products from Computer Friends, RasterOps, Julian Systems, and Comtrex—as well as forthcoming ones from TrueVision and Mass Micro—enable you to easily record Mac graphics on videotape. But the quality of the finished tape depends largely upon the video equipment you use. Understanding basic video



techniques can help you assess the inevitable trade-offs between quality and price.

The Mac Plays Video

The Macintosh and a television monitor both paint pictures on the screen by spraying electrons across a phosphor-coated canvas. Unlike the Mac's video signals, however, images destined for display on television equipment must adhere to the rules of the National Television System Committee (NTSC), 30-year-old specifications adopted when color television was in its infancy.

Display the Macintosh desktop on an NTSC monitor and the first things you notice are flickering lines and illegible text. Because the television picture, or frame, is composed of two alternating images, or *fields*, both repainted 30 times a second, the variation in fine lines from one field to the next shows up as flicker (see "Standards Apart"). Furthermore, a televi-

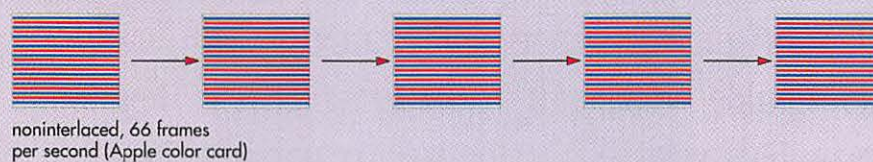
sion monitor resolves into fewer lines than the Mac's does, so you lose detail.

Television studios compensate for these shortcomings by carefully composing scenes and choosing particular colors, graphics, and type styles. Street scenes and barroom sets don't depend upon minute hairlines or very fine dots. Computer-generated screens, however, often do. If you're recording a spreadsheet on tape this could pose a problem. If, on the other hand, you're recording three-dimensional balls bouncing on a computer-generated landscape, it won't. By following a few basic rules you can successfully record images that reproduce well on NTSC video equipment (see "Tips for NTSC Video Producers").

Outfitting the Mac for Video Production

Let's look at the equipment you need to produce a videotape. First, if you want color, you need a Mac II.

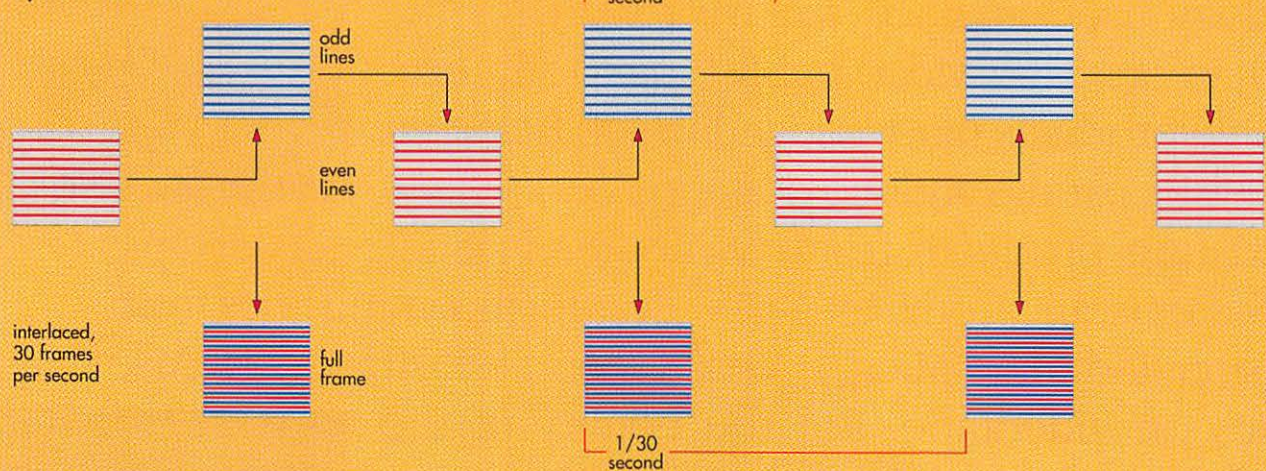
A) Macintosh video



C)



B) NTSC video



Standards Apart

A) Standard Macintosh screens are painted one line at a time, from top to bottom. The Apple Mac II video card paints a screen in about $\frac{1}{66}$ of a second. B) NTSC screens consist of two interlaced frames painted one after another. The odd-numbered lines are scanned first, followed by all even-numbered lines. The two frames, which make up the screen, each

take $\frac{1}{60}$ of a second to be displayed. C) Though an NTSC display consists of 512 lines, as much as 30 percent of the display is lost due to overscanning, blanking, and misadjustment. Of the Mac's standard 480 lines, only about 360 lines are displayed on an average NTSC monitor.

Tips for NTSC Video Producers

I experimented with the Professional version of the TV Producer and the RasterOps ColorBoard 100, recording numerous screen displays on a consumer-quality VCR. I found the following tips, many of which appear in the Julian Systems NTSC Converter manual, to be a great help in producing legible videos.

- Design screens so that they occupy the center portion of

the display. About 10 to 15 percent of the Mac screen, around its edges, will not appear on an NTSC screen or videotape.

- Avoid dithered or alternating dot patterns. Instead use solid shades of color. For example to avoid flicker, use a solid gray desktop instead of the alternating black-and-white pattern.

- Horizontal lines should be at least 2 pixels wide and pref-

erably should contain an even number of scan lines. Lines 1-pixel wide are displayed only half of the time and thus are prone to flicker.

- Fonts larger than 18 points are generally legible on an NTSC monitor.

- Avoid extreme contrasts in color between adjoining areas. If you can, highlight color transitions with a line of black, white, or gray.

Then, to record on a videotape recorder (VTR), you need a board or an external box that produces what's called an NTSC composite video signal.

Unlike most Mac II video cards—which output separate signals for red, green, and blue (RGB)—boards from Computer Friends, RasterOps, Mass Micro, and Comtrex output a signal that combines the color (*chrominance*), brightness (*luminance*), and synchronization signals into one NTSC composite video signal. These boards provide an RCA-type connector, like the ones found on most home videocassette recorders (VCRs), to which you can attach a video cable for a recorder or NTSC monitor (see “Configuring the System”). I used the Computer Friends’ TV Producer and RasterOps ColorBoard 100, which were both shipping as I wrote this article, to record short animation sequences on videotape.

Boards like the TV Producer and the ColorBoard 100 are adequate for recording images on a VCR, but

the results fall short of the quality you get from a professional video production house. Another alternative, Julian Systems’ NTSC Converter, offers similar results. The NTSC Converter, a separate box that attaches to the Mac II Color Video card or SuperMac’s Spectrum/8, converts the normal Mac II video signal to an NTSC composite format.

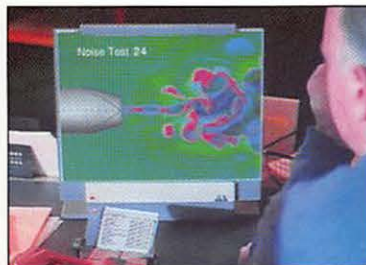
The Advantages of RGB

Most boards that output an NTSC composite signal suffer from the same image-quality problem. In general, video images lose their sharpness and color definition when color and brightness information is combined. Both RasterOps and Mass Micro, however, claim that their boards, the ColorBoard 64 and the Color Space, produce a high-quality NTSC signal; both companies claim their board meets the Federal Communications Commission’s specifications governing a broadcastable NTSC signal.

Since for most boards the weakest link in the chain is the circuitry that converts the RGB video signal to a composite NTSC signal, the solution—albeit



ROBERT CARDIN



The animated sequences from Apple's Project 2000 videotape (right) were created by the San Francisco-based Kenwood Group using the Quantel PaintBox, a sophisticated video animation system. Executive producer Christina Crowley estimated the cost of production at \$68,000.

an expensive one—is to install a board that produces separate red, green, and blue video signals at NTSC scanning rates. Then you can connect a professional-quality NTSC encoder to convert the video signal from RGB to NTSC composite format.

Forthcoming boards from TrueVision, Mass Micro, Comtrex, and the currently shipping RGB version of Computer Friends' TV Producer all offer RGB video output. You can connect these boards directly to an external RGB monitor and thereby display a sharp image; but because most video recorders, even studio models, accept NTSC composite video, you need the NTSC encoder to convert and record the RGB signal.

Monitor Requirements

The gap between the two video standards greatly affects the range of monitors you can choose from. Obviously, in order to view an NTSC composite video signal, you need an NTSC monitor. These run from the consumer-quality models (\$200-\$400) to an industrial-quality display (\$800) to monitors you'd find in a television studio (\$3000). Naturally, the most expensive models produce the sharpest images. Although the best choice for monitoring a recorded signal is an NTSC monitor, there are times when an RGB monitor has advantages. Because it produces a sharper picture, you can get better results with a large screen RGB monitor when displaying an animated presentation, for example. If you already use an RGB monitor to operate the Mac II, you can avoid buying a second screen by making the RGB monitor do double duty. In order for it to do this, the RGB display must be capable of synchronizing to the NTSC horizontal scan rate (15.734 kHz) as well as to the higher Macintosh scan rate. Mul-

tifrequency monitors like NEC's Multisync, Sony's Multiscan, or Mitsubishi's DiamondVision can synchronize to multiple rates. You won't be able to use the Apple High-Resolution Color Monitor for viewing NTSC signals, however, because it synchronizes only to the Mac II Video Card's 35 kHz horizontal scan rate.

Computer Friends, Mass Micro, RasterOps, TrueVision, and Julian Systems products all require a multifrequency monitor in order to view the Mac's screen once you switch to NTSC operation.

Overlays and Keying by Color

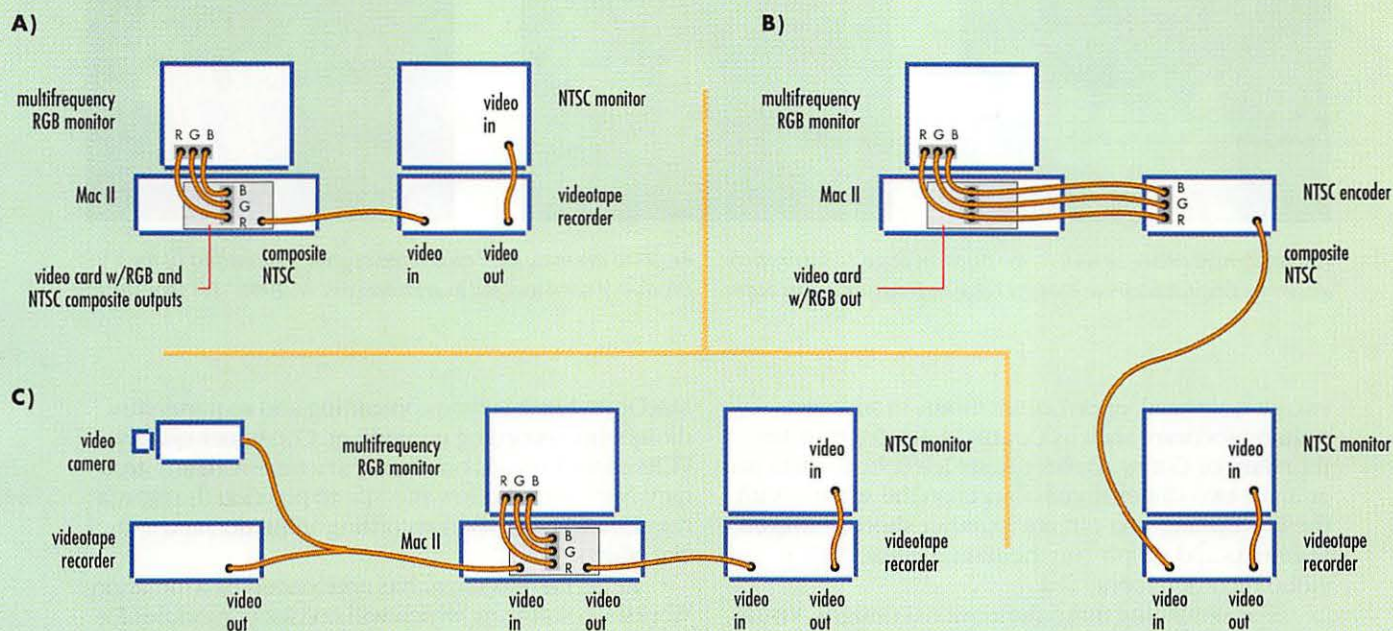
Many visual effects, such as the weather map you see on the nightly news, involve mixing a video signal from a camera with a computer-generated screen. In order to add titles or special effects to a videotape or superimpose Mac-generated graphics onto a camera image, the video input signal must appear in lockstep with the Mac's screen. The images can then be combined and recorded on tape. Video cards with genlock capabilities, like the ones from Computer Friends, TrueVision, Mass Micro, and Comtrex, allow the Mac's NTSC output to synchronize with video input from a camera, videotape recorder, or master sync signal in a production studio (see "Configuring the System"). In addition, boards like NuVision's let the Mac generate a master synchronizing signal for other video equipment.

Once you synchronize the Mac with video equipment, the most common way to combine video images is a technique called *chroma-* or *color-keying*. By making one color transparent to the video signal, you can superimpose a live video picture on the Mac's screen (see "Genlock and Chroma-keying"). For exam-

Buyer's Guide to Video Output Boards

	RasterOps ColorBoard 100	RasterOps ColorBoard 64 w/NTSC-genlock	Computer Friends TV Producer	Julian Systems NTSC Converter
NuBus slots	1	2	1 (requires Apple Mac II Color Card)	0, external unit
Video output	NTSC, PAL optional	NTSC, PAL optional	NTSC, RGB, PAL optional	NTSC
Video RAM	on-board	on-board	uses Apple Mac II Color Card	requires Apple or SuperMac Spectrum/8
Genlock	no	NTSC, PAL optional	NTSC, PAL optional	no
Colors	256	256, 16.7 million	256	n/a
Capture image	no	no*	(optional, scheduled for release in September)	no
Price	\$1795	\$2795	\$799-\$1500**	\$599
Availability	now	now	now	now

*Frame grabber scheduled for June release. ** \$1500 TV Producer RGB-Pro.



Configuring the System

A) Boards like the Computer Friends' TV Producer or the RasterOps ColorBoard 100 require a multifrequency RGB monitor to see the desktop in NTSC mode. The composite NTSC signal can be fed to the video recorder and monitored

on an NTSC display. B) A video card that outputs RGB requires only an external NTSC converter. C) Boards that provide genlock allow the Mac to synchronize signals from a video camera or a video recorder.

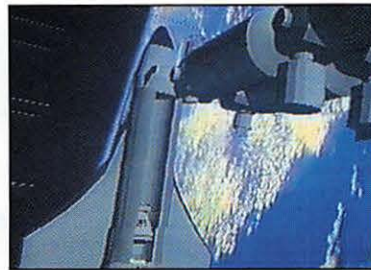
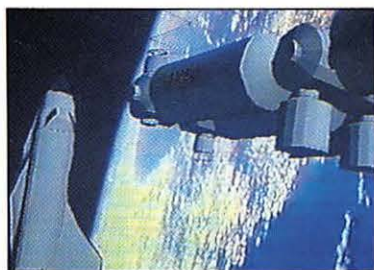
Comtrex Mac II—TV Interface	Mass Micro Color Space II	TrueVision NuVista
1 (requires Apple Mac II Color Card)	1	1
NTSC	NTSC, RGB, PAL	NTSC, RGB, PAL
uses Apple Mac II Color Card	on-board	on-board
NTSC	NTSC, PAL	NTSC, PAL
256	256	256, 65K, 16.7 million
no	digitizer (1 sec.)	frame grabber (1/30 sec.)
\$595 without genlock, \$1495 with genlock	\$1695	\$4250 2MB, \$5995 4MB
now	scheduled for release in July	scheduled for release in the 4th Q

ple, you could specify that all white areas of the screen be transparent. Then drawing a white square on the screen would result in the video picture appearing in that square (and in other white areas). Similarly, you could produce a title by creating black text on a blue background, then replacing the blue background with the video signal.

Animating Objects

Recording a static screen image is fairly straightforward with the equipment discussed so far, but how do you move objects around the screen for recording on tape? Of course, animators like Disney used the tried-and-true method of producing thousands of still frames and shooting them on film one at a time. You can still do this, but the degree of success depends on your tolerance for tedium and the amount of time you have.

There are two methods for producing animated displays: recording a real-time animation played on the Mac, or rendering a series of frames and then recording a single frame at a time. The former method requires that the Mac do all the work, but even that has its limitations. You can also use programs like Macro-Mind's VideoWorks or Beck-Tech's MacMovies to create



The sequences above as well as the ones on page 143 were produced by Chipp Walters at Design Edge in Houston using Sup-

er 3D to animate and model the objects. The output of the TV Producer card was fed to a Panasonic AG1950 VHS tape deck.

two-dimensional, or *cell*, animations. In addition, training software such as Course of Action from Authorware or Course Builder from TeleRobotics lets you animate two-dimensional objects on the screen. With these programs you can put together short, animated segments and simply run them on the Mac with a video recorder connected.

For simulating three-dimensional designs, Visual Information's Dimensions Animations package enables you to animate models created with Dimensions Design. A recently released product from Silicon Beach, Super-3D, and a new entry, Swivel 3D from Paracomp, also let you animate three-dimensional objects on screen. The problem with animating such objects is that *rendering*, or drawing them, takes a tremendous amount of computing power. The Mac can't render scenes containing complex objects at 10 to 30 frames per second, the rate required for smooth motion. The alternative is to render each frame individually and then record one frame at a time.

This frame-by-frame animation method can be used with drawing packages such as SuperPaint and

MacDraw, but it is time consuming and requires studio-quality recording equipment. Consumer-quality VCRs cannot record one frame at a time with any accuracy. Nor do they allow the Mac to position the tape, a required feature when recording animation and special effects.

Aegis Development has announced its Animation Workshop software, which will consist of modules for titling, cell animation, and solid 3-D modeling. Animation packages are also expected from Electronic Arts, WaveFront Technologies, TimeArts, and AT&T Imaging. Packages like these, when used in conjunction with studio-quality recording equipment, promise to yield professional results.

The Mac in the Studio

There's a huge difference between what you can produce with the Mac using a consumer-quality VCR and the results video production houses get using professional-quality equipment.

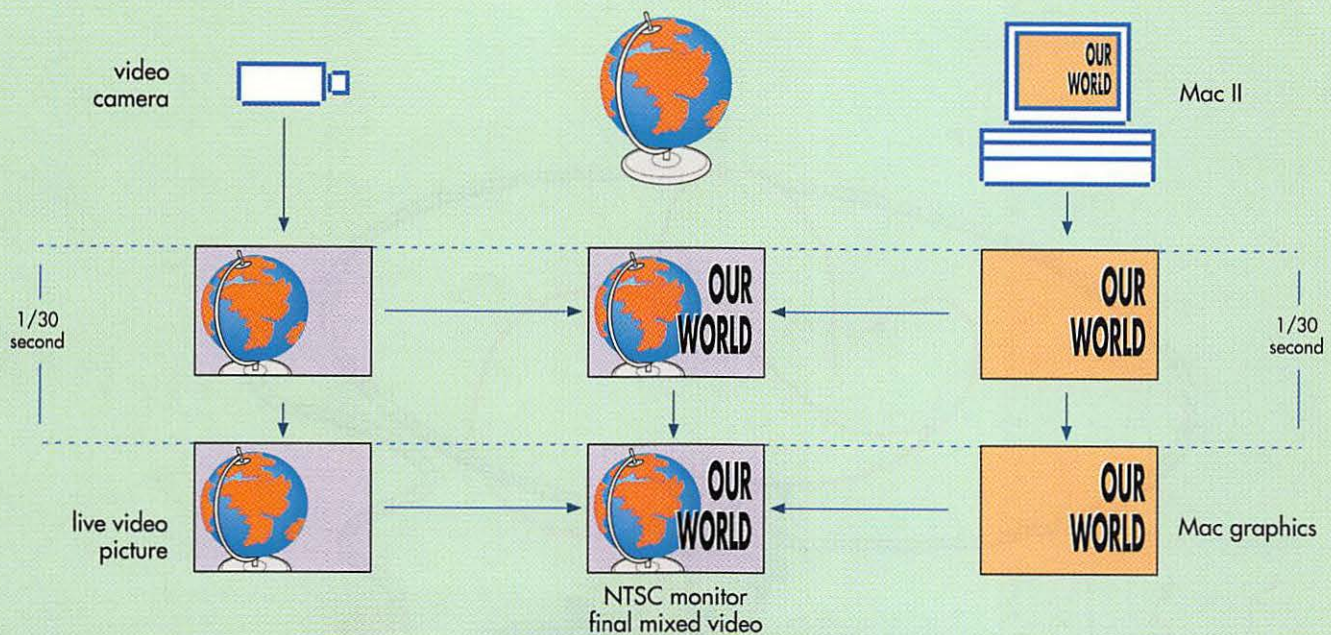
Recording Mac-generated images on a consumer-quality VHS deck is a little like listening to Pavarotti on

Recording at a Glance

Price		Quality	Type	Brand
Expensive	(\$165,000)	High/Broadcast	Digital deck	Abekas A-64
			1" digital tape	
	(\$70,000)		1" analog tape	Sony BVH, Ampex VPR
	(\$30,000)	Mid-range/Industrial	1/2" component tape (Betacam)	Sony Betacam, Panasonic MII
	(\$8000)		3/4" analog tape	Sony BVU, JVC CR850U
	(\$5000)		1/2" S-VHS	Panasonic AG-7500
Inexpensive	(\$200)	Low/Consumer	1/2" VHS	Home VCR decks

Video recorders range from the inexpensive, consumer-grade VHS units to the most expensive 1-inch digital videotape decks found only in professional studios. While industrial and

broadcast-quality tapes require 1/2-inch, 3/4-inch, or 1-inch Betacam units, the most promising personal decks are the SuperVHS recorders, which use the S-VHS format tapes.



Genlock and Chroma-keying

Locking the Mac's display to the signal from a video camera allows Mac-generated text and graphics to be combined with the camera image in various ways. Chroma-keying, the most

prevalent method, makes a color or combination of colors transparent to the video signal.

a dictaphone. You might recognize the voice, but it's doubtful whether you could tolerate the sound quality. In fact, regardless of how clean a video signal you start with, it degrades when you record it. Ultimately the type of recorder you use determines the quality of the final taped signal (see "Recording at a Glance"). Most industrial-grade videos are recorded on $\frac{3}{4}$ -inch tape, while the highest quality results come from 1-inch or Betacam recorders. The recently introduced Super-VHS recorders accept $\frac{1}{2}$ -inch tape but record separate color and brightness signals, as do Betacam models. The S-VHS format used in Super-VHS machines offers a signal quality somewhere between that of $\frac{3}{4}$ -inch tape and VHS. While the S-VHS and Betacam machines offer higher quality than their NTSC counterparts, they require a studio device called a transcoder to convert RGB into the luminance and chrominance signals. In the future, most NTSC-board manufacturers plan to offer cards that output the correct signals for an S-VHS recorder.

Accurate tape positioning is another key requirement in professional productions. Most 1-inch, $\frac{3}{4}$ -inch, and Betacam recorders use what's called a SMPTE time-code generator to number each frame on the videotape. The code generator counts the elapsed minutes and seconds and the frame number; with a time-code reader, you can position the tape accurately at any frame for editing or adding sound. To further guarantee accuracy when adding special effects or titles, another device, a time-base corrector, stabilizes the re-

corder's video signal so that the computer display is tightly synchronized or genlocked to the recorded signal. Studio equipment differentiates an amateur production from a professional one, but the high cost limits its use to the studio.

Viable Video on a Macintosh?

Without doubt, the Mac now creates some of the sharpest screen graphics at the lowest price around. The ability to get those graphics onto tape makes video a viable method of publishing. How large a part the Mac plays in producing videos for presentations, promotions, and simulations depends upon the ease with which forthcoming animation, simulation, and titling software will enable users to produce professional-looking results. Successful video publishing on the Mac also depends on how sharp an image manufacturers can deliver at an affordable price. With the proliferation of S-VHS recorders and the eventual acceptance of high-definition television standards, professional-quality video will be achievable on the Mac. Broadcast-quality video, on the other hand, may remain a studio affair for some time. But just as desktop-published newsletters needn't compete with magazines or newspapers, so you can still produce a lot with Macintosh video now. □

See *Where to Buy* for contact information.



Paint Roundup

A brush with eight low-cost paint programs

by Adrian Mello

Graphics is the Mac's strong suit. In the past year, programs such as PixelPaint and ImageStudio have upped the ante. But most people can't afford to sit down at a desktop with these high rollers—each costing around \$500. And the expense doesn't stop there; you still need a Mac II system with a reasonable amount of memory and storage capacity in order to use these programs as intended. Don't forget to add the price of a gray-scale scanner or a color output device, as well.

After being awed by the high end of Mac graphics, most of us have to come back to financial reality. Reality comes in the form of several programs with paint capabilities: Canvas, Canvas DA, ComicStrip Factory, DeskPaint, Draw It Again, Sam 2.03, FullPaint, GraphicWorks 1.1, MacPaint 2.0, and SuperPaint. Most of these programs cost less than \$200 and have basically been designed to work within the limits of a Mac Plus or an SE. All produce acceptable results on an ImageWriter printer, and about half of them let you take advantage of a laser printer's ability to print high-resolution text and graphics.

The category defining paint software is changing. In fact, the name *graphics software* might be more appropriate. Some of the programs reviewed here are not, strictly speaking, paint programs. Several include object-oriented capabilities. In Mac terminology, a *paint* program creates images made up of a pattern of dots, or pixels. Each dot holds one *bit* of information—the pixel is either on for black or off for white. Paint programs are also frequently called bitmapped graphics programs.

Object-oriented graphics programs, called *draw* programs in Mac parlance, use a different technique to construct an image. A draw program stores the line or shape's mathematical definition, rather than a fixed pattern of dots. Even though the programs discussed here are hybrids, I'll focus on their strengths and weak-

nesses as paint programs. Paint capabilities stand apart as a cohesive set of features, even when they are separated from draw features in discrete layers or objects.

Ease of Use versus Features

The key to finding the best paint program comes down to searching for the best balance between ease of use and features. One of the best qualities of a paint program is that you can start working with it almost immediately. Paint programs are the closest that graphics programs come to simulating the way artists work with real brushes and pencils. In a paint program you simply pick a tool from a palette and drag it across the drawing surface. Everything you draw remains on screen as a unified collection of dots, or pixels.

MacPaint was the first paint program, and its successors have added more and more features to this simple foundation. A basic set of painting tools should include a paintbrush, a pencil, a paint bucket, and a spray can or airbrush. A program's palette should also include shape tools, line tools, and an editable set of patterns. Beyond these features each program has its own approach to refinements. For example, instead of a standard spray can, some programs provide control over the spray's shape, pattern, and flow characteristics. Measuring aids such as rulers or mouse-position readouts—and special effects such as skew, trace, invert, and rotate—may or may not be included in a paint program. Other options include the ability to control line weights on opposing sides of a shape, and special printing features for making cards or banners.

A complete list of refinements would take pages. The fine points rarely outweigh the importance of a paint program's overall design. Nevertheless, highly specific features of this type may make a difference to you, depending on the type of drawings you make and

your work idiosyncrasies. You can compare some of the programs' features in the table "Features Sketch." I'll go over the most important aspects of the programs below. Although these capabilities have made MacPaint's successors much more powerful, they have often also made the programs more difficult to use. Chief among these problematic features are object-oriented graphics and layers.

Object Objections

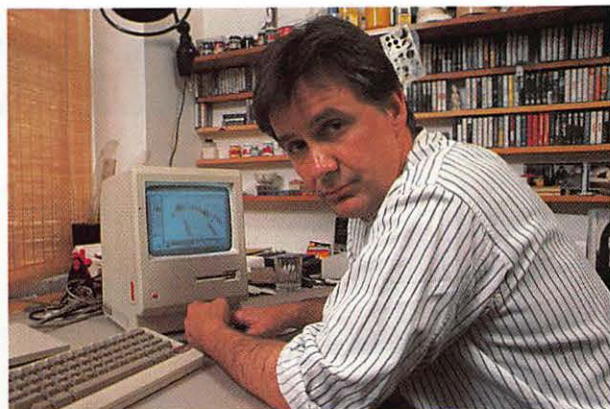
The problem with objects is that they can't be edited as naturally as bitmaps. Each object is separate from each other object in the picture, so even though you can see the picture as a whole you can't work with the drawing as a whole. Whereas paint programs are homogeneous, object-oriented programs are heterogeneous. To edit an object you must first select it. If objects are superimposed, you may not be able to select the one you want without first rearranging the stacking order of the objects. All this added manipulation can be a nuisance.

However, objects have important advantages that can easily outweigh their disadvantages. Objects retain their identities and characteristics, and they can always be reshaped independently of other objects in the drawing. Object-oriented graphics also let you take advantage of laser printers and other high-resolution output devices.

Different programs integrate object-oriented capabilities to different degrees. For example, Canvas and Draw It Again, Sam emphasize an object-oriented approach. At the opposite end of the spectrum are programs like FullPaint and MacPaint, which have no object-oriented capabilities. ComicStrip Factory's and GraphicWorks' bitmaps are drawn in objects called easels or panels. These objects let you maintain the integrity of different bitmapped regions in the drawing. In this way the background doesn't have to be redrawn when you want to alter or move something in the foreground.

Uncovering Layers

Having to arrange objects from back to front is probably the greatest source of irritation in using a draw program. The problem is compounded when paint capabilities are combined with object-oriented capabilities, because the paint tools don't function unless you are working in an object or region specified for painting. Even experienced users catch themselves trying pointlessly to apply paint tools on objects and draw tools on painted areas. Programs that are chiefly object-oriented are especially difficult in this respect. These programs let you edit only bitmaps within specified objects, sometimes called bitmapped objects or easels. These objects appear side by side with regular objects so you must first distinguish and select them before applying the appropriate tools.



A Change of Media

Illustrator Andrzej Dudzinski, whose noncomputer work regularly appears in such national magazines as the Atlantic and Playboy, is enthusiastic about exploring new stylistic possibilities using the Macintosh and MacPaint.

A partial solution to this problem is to use layers to separate paint and draw functions. SuperPaint was the first program to use layers to separate bitmaps from objects. All bitmap editing is performed in one layer, and all object editing is performed in another layer. One of the advantages of this approach is that you can easily separate objects from the bitmapped portion of a drawing. If you want to concentrate on painting, it's best just to avoid the draw layer or to hide it. Unless you hide the inactive layer, however, it's easy to confuse bitmaps for objects in the same way that you would if there weren't layers.

A more common use of layers is to separate logical collections of drawing components—like separating the plumbing from the rest of the structure in a building plan. Draw It Again, Sam is currently the only program with paint capabilities that lets you create up to ten layers. You create the layers, specify the stacking order, and indicate in a single dialog box whether the layers are visible, invisible, or grayed out. Although Sam lets you use a layer exclusively for painting, paint regions within the layer are still discrete objects, as opposed to a single bitmapped layer. A few vendors plan to add layers to their products in upcoming versions. Like superimposed objects, having multiple layers means that you spend extra time arranging layers in order to work on different aspects of a drawing. A strong paint program should have at least one full layer dedicated to working with a bitmap, so you don't have to set up an area to paint in.

Handling the Drawing

Some programs offer a set of features that determine how flexibly you can manipulate drawings as a whole. These features include multiple windows, the ability to manipulate drawing size and orientation, and scrolling. If you plan to make extensive use of clip art,

or to cut and paste between two or more drawings, then you should look for a program that can open multiple documents simultaneously. If you plan to work on big drawings or you prefer to work in landscape view, find a program that can accommodate the appropriate drawing size and shape.

The flexibility of selection tools is especially important when you're working with artwork. All the programs reviewed here include the selection marquee, for selecting rectangular regions, and the lasso, which works more like a pair of scissors cutting around the shape you want to select. Selection tools, and drawing tools for that matter, should scroll automatically when they cross the screen's edge. It's frustrating to have to stop in the midst of an operation, scroll the screen, and reselect the section of the drawing before you can move again. By the same token, some users appreciate the ability to disable the auto-scrolling function when they want to work within the confines of the screen. It's also nice to be able to select the entire drawing area both within and beyond the screen's edge with a single command.

Text

Object-oriented programs have another important advantage: the way they handle text. In a strict paint program, text is only a graphic. Once you type it in, it becomes part of the overall pattern of dots and loses its identity as editable text. But in object-oriented programs, text regions retain their characteristics, providing a number of advantages. Since text regions are designed for handling text in much the same way that a word processing program is, you can edit text and return to the text later to make any desired editing changes. You can also take advantage of a laser printer's built-in high-resolution fonts.

Not all object-oriented programs handle text in the same way. ComicStrip Factory and GraphicWorks have separate text regions called *balloons*; you can edit the shape of the region as well as the text it contains. For example, you can type text that appears in an oval. Some programs let you mix fonts, sizes, and styles in the same text object. Other refinements let you justify text left, right, or center; create patterned text; show white text on a patterned background; or specify a custom font size.

Bits and Details

When you work with a paint program, you work with pixels. It is not surprising that detail-oriented features play an important role in a paint program. It's difficult to see individual pixels, but if you look closely at a picture you can see rough edges. Ever since MacPaint introduced FatBits, a feature that lets you view the pixels at eight times their original size, programs have added more flexible magnifications. Most programs

now let you magnify a section of the drawing in several sizes. A half-size, or 50 percent, view is useful for zooming out and getting a better sense of how artwork works on a page. Ideally, all tools work at all magnification levels, but in some programs you can't use tools, for example, in the 50 percent view.

Beyond just magnifying images at the 72 dots per inch (dpi) supported by the Mac's screen, some programs even let you edit bitmaps at higher resolutions, such as 300 dpi. It takes more memory to manage bitmaps at higher resolutions, so some programs restrict the size of the bitmap you can work on at one time. A resolution beyond 300 dpi is of questionable value since it requires a huge amount of memory—besides, working at that level of detail is like engraving on the head of a pin.

A related issue is what types of file formats a program can read. If you plan to edit scanned images at 300 dpi, for example, you should be able to import a scanned image. Standard file formats that every program should have are PICT and MacPaint. PICT is especially important if you want to work with object-oriented graphics. Some programs even support features of PostScript such as bezier curves and gray-scale patterns. Because of this, you may want to be able to read and write encapsulated PostScript (EPS) files. If

Object-oriented programs have another important advantage: the way they handle text. In a strict paint program, text is only a graphic.

you want to send images to someone with different software, you should also be able to save your work in the appropriate file format.

That wraps up the major features to consider when you're picking a paint program. Keep in mind that the way you work should ultimately determine your choice of product. For example, if your work involves editing TIFF images created with a scanner, you need a program that can import this file format. In this case, other features become secondary. The product summaries that follow should help give you a sense of each program's overall design and its major strengths and weaknesses.

Features Sketch

	Canvas	Canvas DA	Comic Strip Factory	DeskPaint
General				
Version #	1.02m	1.02m	1.6	1.05
Minimum memory required	512KE	512KE	512K	512K
Application size	253K	49K ¹	80K	32K
Preferred size in MultiFinder	597K	n/a	320K	n/a
Saves, opens MacPaint files	opens only	opens only	both	both
Saves, opens PICT files	both	saves only		opens only
Saves, opens TIFF files	opens only			both
List price	\$195	\$99.95	\$69.95	\$129.95
Screen layout				
Drawing area	9 × 9 ft.	9 × 9 ft.	8 × 10 in.	55 × 55 in., ltd. by memory
Maximum number of windows	ltd. by memory	ltd. by memory	1 plus library	3 (need multiple DAs)
Opens to full screen size	•	SE or Plus	•	
Select entire document	•			•
Layers				
Hides layers selectively				
Panels			•	
Libraries	•		•	
Movable/hidable palettes				
Scroll bars	•	•	•	•
Drawing tools autoscroll	•	•		shape tools only
Selection tools autoscroll	•	•	objects only	•
Autoscroll cancelable				
Magnification levels	unlimited	unlimited	3	9
All tools avail. in magnification	• ²	• ²	8× only	•
Grid	adjustable	yes, can't snap to		adjustable
Rulers, readouts	both	both		
Painting				
Distort	•			
Skew	•			
Perspective	•			
Rotate by single degrees	•			1.4°
Trace edges				
High-resolution bitmap editing	up to 2540 dpi	300 dpi		up to 4000 dpi
Paint bucket fills off-screen area	•	•		•
Paint in patterns	•	•		•
Patterns editable	•	3		•
Brushes editable	•			preselected shapes
Spray tool adjustable	•	•		no spray tool
Transfer modes	8	8	4	8
Drawing				
Group/ungroup	•	•	•	
Align objects	•	•		
Bring to front, send to back	•	•	•	
Lock	•			
Show size	objects only	•		
Bitmapped objects	•	•	•	
Smooth polygon	•			
Add/remove polygon vertex	both	both		
Gray-scale patterns				
Bezier curves	•	•		
Text				
Mix fonts, styles, sizes in blocks	•	•	•	
Align text R/C/L	•	•	•	•
Editable text	•	•	balloons	

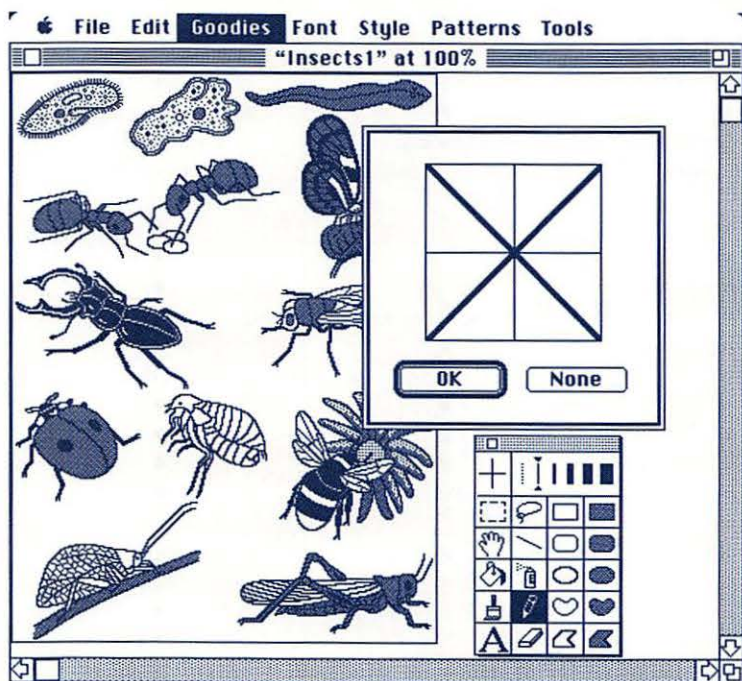
¹An additional 123K required for Canvas Helper. ²Only magnifications in powers of 2. ³Can't create but can use edited patterns. ⁴In silhouette objects only.

Draw It Again, Sam	FullPaint	GraphicWorks	MacPaint	SuperPaint
2.03	1.1e	1.1	2.0	1.1
512KE	512K	512K	512KE	512K
239K	145K	217K	133K	162K
526K	384K	368K	512K	368K
both	both	both	both	both
both		both		both
		opens only		
\$150	\$99.95	\$149.95	\$125	\$129
30 × 30 ft.	8 × 10 in.	2 (8 × 10 in.) ⁴	8 × 10 in.	8 × 10 in.
ltd. by memory	4	1 plus browse file	9	ltd. by memory
•	•		•	•
•	•	•	•	•
10				2
•				•
•		•		
	both	both	both	patterns movable only, others both
•	•	•	•	•
yes, not when resizing		objects only	•	•
•	marquee		•	•
				•
10	2 plus page view	5	5	5
•	•	•	•	all but reduced view
adjustable	•	adjustable	adjustable	adjustable
both	both	rulers only	readouts only	rulers only
	•	•		•
	•	•		•
	•	•		•
	•	•	by 90° increments only	•
	•	•	•	
•	300 dpi	•		300 dpi
•	•	•	•	•
	•	•	•	•
•	•	•	•	•
•			preselections	
4		9	8	by line weight 3 for brushes
•				•
•		•		•
•				•
•		•		
•		both		add only
				•
		•		
•		•	•	•
•		balloons		•

MacPaint

The purist's paint package. MacPaint includes no object-oriented capabilities, but this makes it the easiest paint program to learn and use (see *Reviews, Macworld*, August 1988). Overall, MacPaint has the simplest and most elegant design. Besides being the easiest to learn, MacPaint is the most forgiving of all paint packages. The program lets you take a "snapshot" of your drawing and continue working on it. Later, using a "magic eraser," you can selectively erase just those changes made since the snapshot without altering the rest of the drawing. The program has good magnification controls, and lets you use all tools in the 50 percent view.

If you are concerned with getting the most value in one package, however, paint programs that provide object-oriented drawing capabilities are a better buy. If you have a laser printer and you really want to show off its strength in your graphics, then MacPaint is insufficient. But if you already own an object-oriented program and you plan to keep your draw and paint activities separate, MacPaint may be your best choice. Beginners should try out both MacPaint and SuperPaint to see which one they prefer.



MacPaint

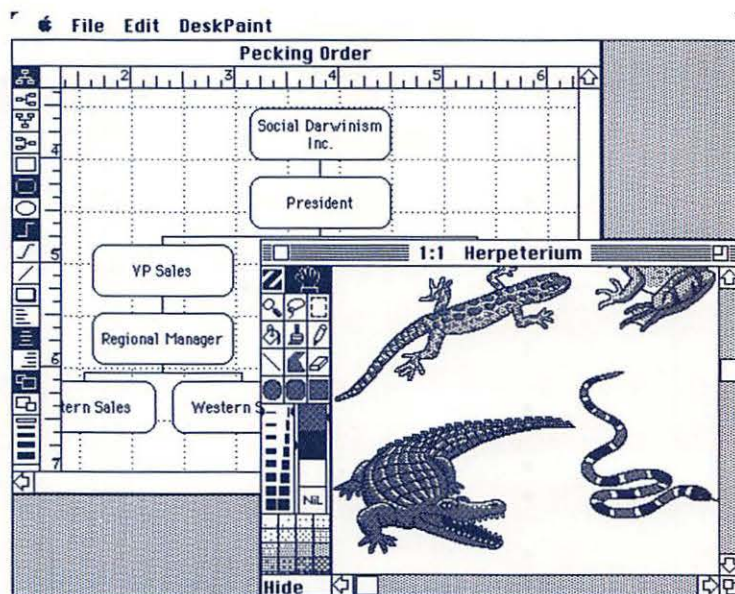
In MacPaint, current magnification is always conveniently indicated in the window's title bar. The tool palette has been moved from its menu position into the lower right corner. The Brush Mirrors dialog box has been selected so that the artist can paint in kaleidoscopic fashion, each brush stroke mirrored in the painting's four quadrants.

DeskPaint

DeskPaint shows just how much desk accessories have improved. If you want a full-featured paint DA to complement your work in PageMaker or other programs, DeskPaint is an excellent choice. Using a DA may be necessary for interactive work with applications if you can't afford enough memory to store multiple applications in MultiFinder. DeskPaint even provides multiple magnifications and edits TIFF files.

While Canvas DA is an impressive subset of an object-oriented program, DeskPaint is a paint application in desk accessory format. Choosing between these desk accessories is similar to choosing between Canvas and a paint-only program. Keep in mind, however, that you could complement another graphics program's emphasis on object-oriented or bitmapped graphics with the alternate strengths of one of those DAs.

A new version is planned for September release. DeskPaint 2.0 will read most graphics formats, add air-brush, charcoal, and smoothing tools, and edit images in any magnification. Zedcor has also announced that DeskPaint 2.0 will be able to trace bitmaps, turning them into polygons that can be edited in a second desk accessory called DeskDraw. DeskDraw will be included in the \$129.95 package and will be roughly comparable to early versions of MacDraw. As other paint programs begin to climb in price, DeskPaint 2.0 may come to represent the best buy among low-end paint programs that also offer object-oriented capabilities.



DeskPaint

Because it is a desk accessory and takes up relatively little space, DeskPaint can be used within other applications in floppy-based Macintoshes that do not have memory to spare. In this case a graphic is being added to the More outlining program.

SuperPaint

For the past year or so SuperPaint has been the market leader, and for good reason. SuperPaint continues to represent the best tradeoff between features and ease of use for applications that focus on painting. It is also the best choice for people who value the flexibility of a paint program but still want to take advantage of object-oriented graphics. But SuperPaint does not let you edit in a 50 percent view and currently does not permit the mixing of fonts, styles, and sizes in text windows. At this writing, the program still has an annoying incompatibility with Mac IIs set in color mode. Dots appear across the top of the screen until you reset the monitor choice to two levels of black-and-white in the control panel.

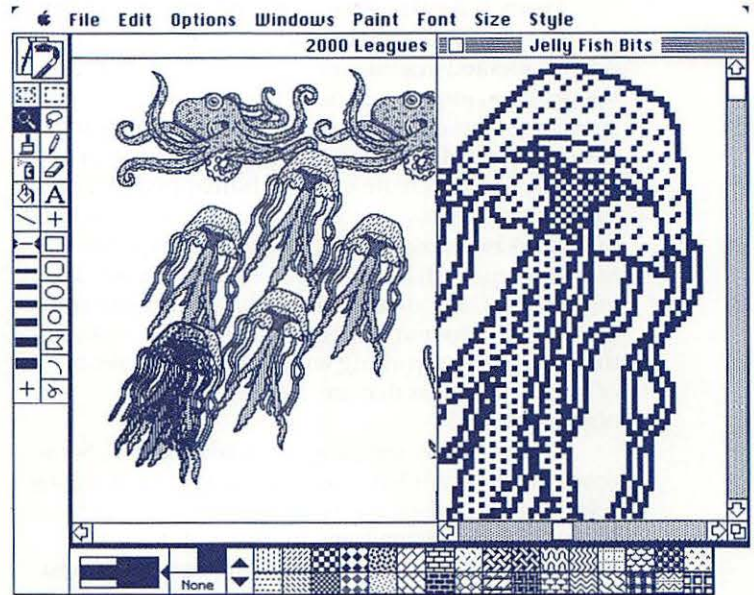
A new version, SuperPaint 2.0, has been announced and should be available by the time you read this for just under \$200. Announced features include color preview on a Mac II (you can't work in color but you can see colors assigned to objects), customizable palettes, and TIFF support. Page size will be restricted only by memory, and 300-dpi editing windows will be up to a page in size depending on available memory. The update will also correct current text limitations by letting users mix fonts, styles, and sizes.

Canvas

Canvas is an object-oriented program first and a paint program second. To create and edit bitmaps in Canvas, you must first draw an object and then specify it as a bitmapped region. This is fine for adding details to objects, but it's awkward if you chiefly want a paint program.

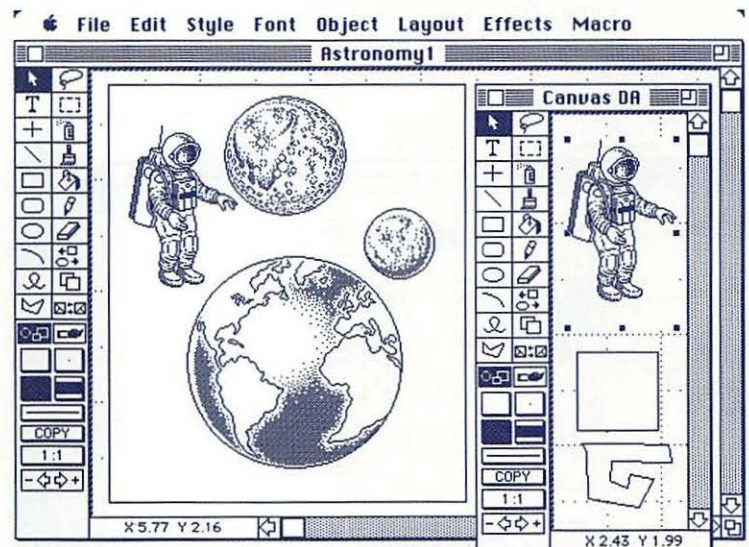
In terms of overall capabilities, Canvas is probably the most powerful program I looked at. It combines a full set of drawing, painting, and text features in a single program. Canvas lets you create extremely large drawings, spanning an area 9 feet by 9 feet, and you can edit at the microscopic resolution of 2540 dpi. The program lets you work with bezier curves and import TIFF files (as well as most other graphics file formats). Version 2.0 is planned for release by the time this article appears, and will add multiple layers, gray-scale editing, and a number of other refinements. Version 2.0 will also increase in price from just under \$200 to nearly \$300, making it the most expensive program of those surveyed. Currently, Canvas includes the versatile Canvas DA, which provides most of the stand-alone program's features. The DA will probably no longer be included after the arrival of Canvas 2.0 and will be sold separately instead.

Canvas is the best choice if you want a chiefly object-oriented program but you also want to create and edit bitmapped details. But Canvas is not for everyone. Due to its object-oriented nature and the sheer number of its features, it lacks the seamless nature of a dedicated paint program.



SuperPaint

SuperPaint uses the icon at the top of the tool palette to indicate whether the paint or draw layer is currently selected. When the paintbrush is foremost, the paint layer is active. When the compass is in front, the draw layer is active. SuperPaint opens a separate window and file for each section of the drawing that is edited at 300 dots per inch.



Canvas

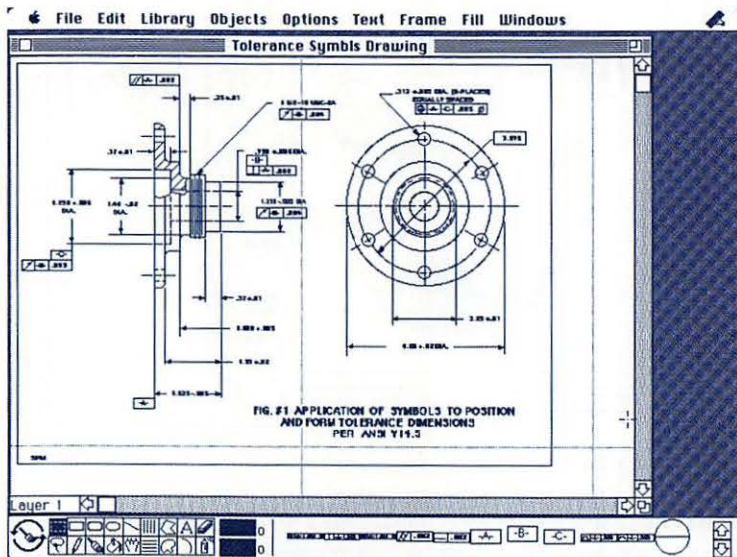
To create a paint region in Canvas, you must first draw an object, such as a rectangle, and then specify it as a bitmapped region in the Object Specifications dialog box. Currently, Canvas also includes a capable desk accessory called Canvas DA (lower right.)

Draw It Again, Sam

Like Canvas, Draw It Again, Sam is chiefly an object-oriented graphics program. With version 2.01 the program introduced paint features, letting users specify objects as bitmaps. Sam simplifies working with bitmapped objects somewhat by giving you two options. You can create multiple bitmapped objects in succession so that you don't have to specify individual objects as bitmaps, or you can create a single bitmapped region that expands to encompass any drawing you do. Combined with the ability to create and centrally control ten layers, Sam has the best conceptual approach to working with bitmapped objects of all the programs that are, for the most part, object-oriented.

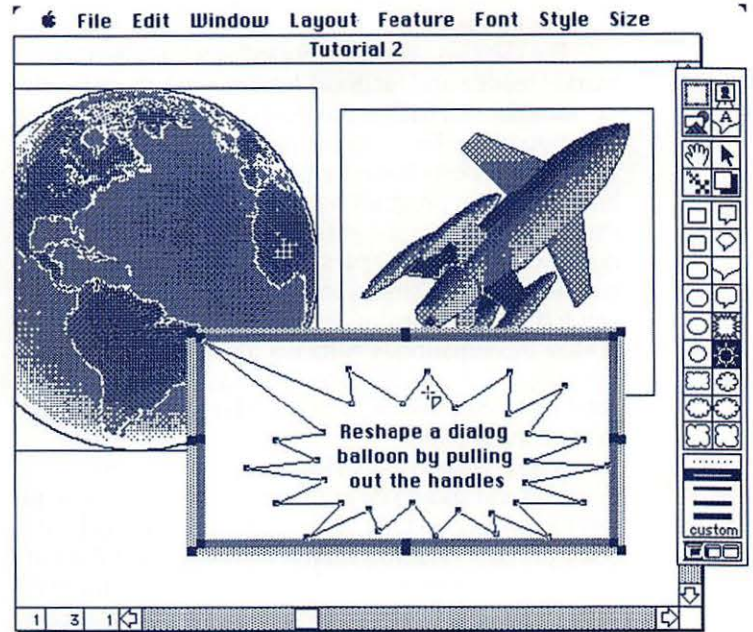
Unfortunately, the program is unpolished. Sometimes the program left screen artifacts after changing selections. Dragging the lasso beyond the window's edge regularly left artifacts on the scroll bars. The screen response of Sam's paint tools was the slowest by far of the programs I examined. And Sam doesn't include alignment commands, a major oversight for an object-oriented graphics program. Furthermore, you can't mix fonts, styles, and sizes in a text block.

Because both Sam and Canvas are built around their draw capabilities, they merit direct comparison. With the exception of layers and the way bitmapped objects are created, Canvas has superior features and is the better finished of the two. Aba showed me a beta version of an upcoming release 2.1 that corrected some of the bugs I saw in version 2.03, so you may want to reconsider Sam when the new version comes out.



Draw It Again, Sam

This drawing was created with the help of Draw It Again, Sam's library feature. A library containing tolerance symbols, which can be selected and used in the drawing, appears at the bottom of the screen.



GraphicWorks

The three rectangles in the drawing can be superimposed to create a single graphic. In the foreground a dialogue balloon has been created and reshaped. Note all the balloon shapes on the dialogue-balloon tool palette (far right).

GraphicWorks

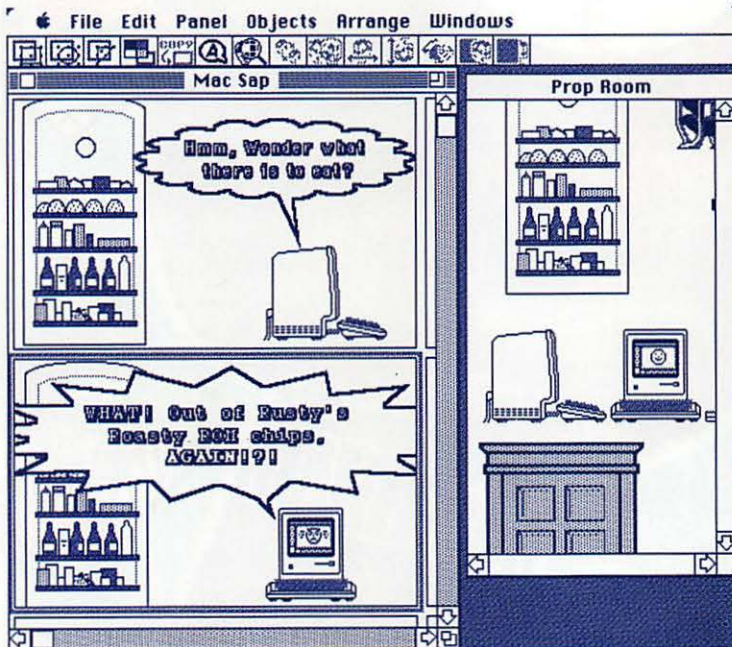
GraphicWorks is best suited to applications that require frequent overlaying of bitmaps and the manipulation of panels. This program's original name, ComicWorks, was more appropriate. GraphicWorks has one of the most powerful sets of paint features, including a highly controllable airbrush tool, nine transfer modes, multiple magnifications, and the ability to import TIFF files. The program also has excellent text-editing capabilities due to text-oriented objects called dialog balloons.

You create separate objects for normal and high-resolution bitmaps, text, and shapes. The program has a multitude of tool palettes for working with the different object types. Unfortunately, working with so many objects, many of which are overlaid, makes GraphicWorks too cumbersome for most applications. The program trips over itself. For this reason, I can't recommend it for most users. However, if you want to create comic strips or otherwise manipulate complex sequences of text and bitmaps, GraphicWorks is an excellent choice.

ComicStrip Factory

Like GraphicWorks, ComicStrip Factory is designed for working with comic strips. However, the program is intended more as a production tool than as a painting tool. The idea is to create artwork in a stand-alone paint program and assemble it via a library window. A utility called PartMaker transforms individual shapes from files saved in MacPaint format so that you can select them automatically by clicking on them. Thus you avoid the painstaking process of carefully encircling each shape with the lasso. Once shapes are brought into an actual comic strip, you can edit them only in an 8-times magnification.

On the whole, ComicStrip Factory is designed for people who are not artists but who want to learn how to make their own comic strips. The program definitely has a countercultural flavor, which shows up in the documentation and the templates. Comic-strip enthusiasts and artists may appreciate the tone and orientation of this product, but business users won't. While GraphicWorks certainly has stronger drawing features, ComicStrip Factory is inexpensive enough that comic-strip enthusiasts who want to try their hand at creating comics should look into this program. But ComicStrip Factory is not suited for most graphics applications.



Comic Strip Factory

The comic strip on the left came configured with panels. Clicking on the small images in the window on the right automatically selects just the image without any surroundings. Once the image is selected, you can copy and paste it into the comic strip.

FullPaint

FullPaint is sorely in need of an update. When it was first introduced, it corrected most of the major deficiencies of the original MacPaint, but now it is showing its age. FullPaint has no object-oriented capabilities, and its windows cannot grow larger than the Plus's or the SE's screen. In its current form, FullPaint is probably not the best paint program for your needs. Ashton-Tate acquired FullPaint along with FullWrite Professional early this year, but a spokesperson states that the company is not upgrading the product.

FullPaint used to serve as an option for users who weren't satisfied with MacPaint but appreciated the classic's simplicity. Well, the classic is back and it's better. With a few minor exceptions, MacPaint is a much better choice for beginners and users who prefer simplicity in paint software.

Drawing Brushes

So which program should you choose? If you draw more than you paint, look at Canvas. On the off chance that you draw comic strips, design sets, or otherwise layer text and bitmaps, you should examine GraphicWorks and ComicStrip Factory.

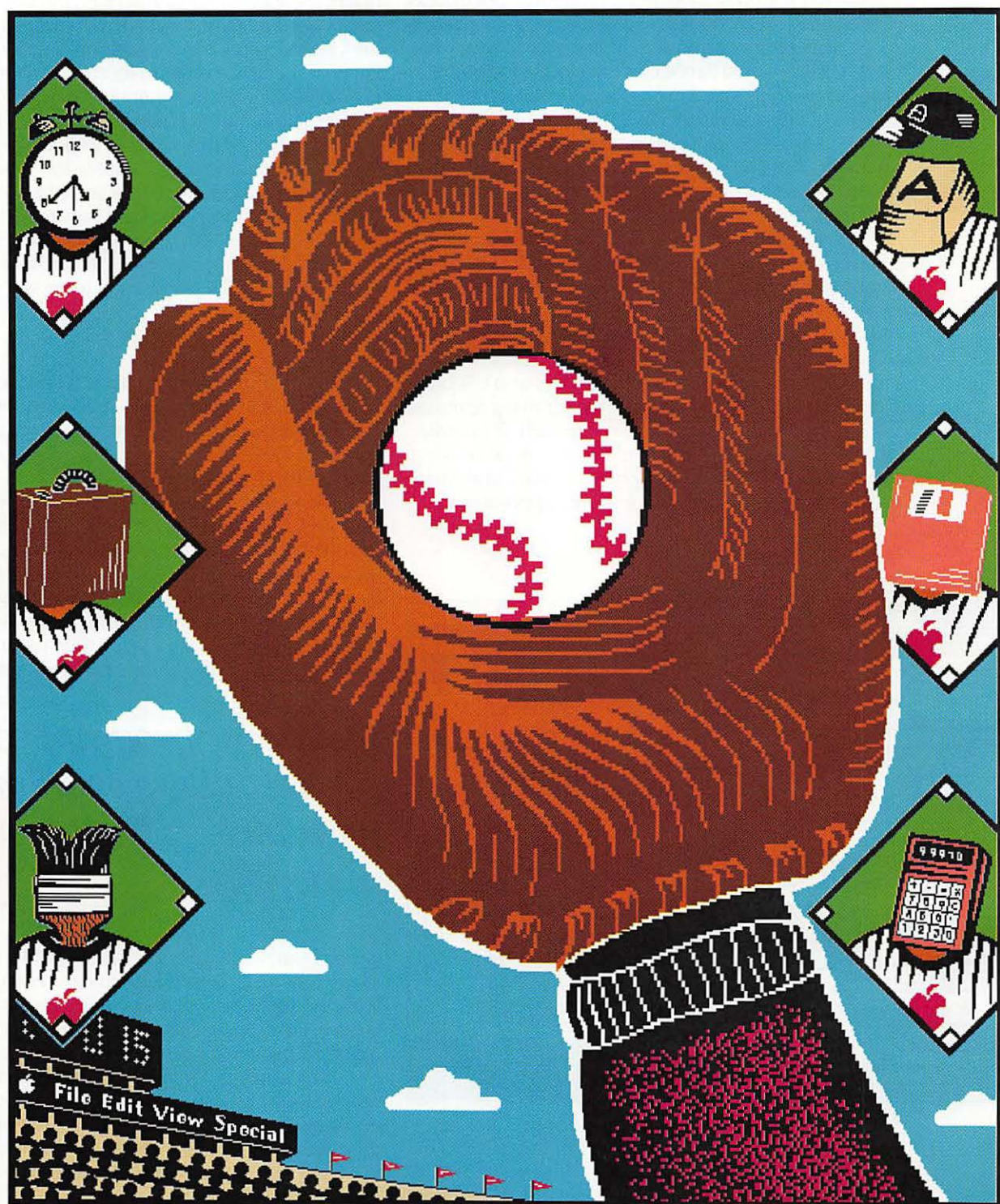
If you paint more than you draw, however, you have three basic choices: MacPaint, DeskPaint, and SuperPaint. If you don't care about object-oriented graphics and you prefer simplicity, MacPaint is your best bet. If you spend a lot of time working with desktop publishing programs and you want a desk accessory to complement your work, then point your brush at DeskPaint. Overall, however, SuperPaint is the best

Whichever program you choose, all are eminently affordable. A few are priced under \$100.

general-purpose paint program available. I'm anxious to see how well the program integrates the next version's powerful new features into the mix. Even in its current form, SuperPaint remains the best program for intensive paint applications.

Whichever program you choose, all of them are eminently affordable, a few with mail-order and discount retail prices under \$100. You can purchase several of these programs for the price of a single software ace like PixelPaint and ImageStudio. But that's a strong suit of a different color. □

See *Where to Buy* for contact information.



The (D)A Team

*Meet the desk accessory dream team—
the 15 most effective troubleshooters and
problem solvers under the Apple menu*

by Steven Levy

To the best of my knowledge, Apple doesn't include a desk accessories evangelist among its team of full-time proselytizers. This is a regrettable omission, because a recent sounding of the Macintosh community has uncovered the scandalous fact that people are underutilizing desk accessories (DAs). Don't they *know*? Aren't they aware of the value of using those handy part-time applications available under the little apple at the left of the menu bar? Don't they realize how neat it is that DAs are available from within any application, that they take up relatively little space on a hard disk, that they generally cost less than full-blown programs, and that they are often the most elegant solutions to niggling but frustrating computing problems?

What's stopping people? Is it that they are intimidated by the prospect of using Font/DA Mover to install DAs other than the mostly goopy ones that come with the standard System? Do they think MultiFinder will solve all their do-two-things-at-the-same-time problems? (It won't, buddy.) Or is it that hopeless feeling that comes from waking up one day and realizing that there are hundreds, maybe even thousands, of desk accessories available—and you don't know which ones would form the perfect complement?

If the latter is the case, breathe easy. Or, as that charming thespian known to his adoring public as Mr. T might say, "Listen up, fool—the DA Team is here to take care o' business!"

Yes, the DA Team. Fifteen of the sleekest, meanest, most powerful desk accessories known to humankind. (Fifteen, by no coincidence, is the number of DAs a

Mac system can accommodate.) How tough are they? Well, they won't crash your System—but they could if they wanted to.

It wasn't easy picking the DA Team. I had to poke around various Mac installations, note which DAs found their way onto people's systems, and figure out which ones they used the most. This information was supplemented by a formal poll of the savvy crew at *Macworld* to see which players they consider the cream of the crop. All suggestions were taken back to my personal DA-testing bunker, where I stress-tested the lot of them. I was pleased to find that during the last year a bold new generation of desk accessories has emerged—programs that are often as powerful as stand-alone applications but that retain all the advantages of DAs.

One caveat: Since everybody's needs vary, your own ideal DA set will probably differ somewhat from the dream team. For suggestions on substitute members, check out "Special Teams." Whatever final mix you arrive at, by studying the dossiers of the DA Team presented here, you can start thinking about how to goose your productivity by installing a customized hit squad of your own under the Apple menu.

Oldies but Goodies

The first few spots on the dream-team roster have to go to some of the standard desk accessories that are required for proper Mac maintenance. For example, no one should be without the **Control Panel**, which has evolved from a relatively trivial "crib toy" with switches, levers, and buttons to a multilayered system that enables you to set parameters you didn't know existed. (Can I see a show of hands by all those who have

Steven Levy is a contributing editor to Macworld; he has been a fan of desk accessories since he first solved the Puzzle DA on the 128K Mac.

changed the default for the proper interval between mouse clicks?) The Control Panel is also where you can control useful utilities called CDEVs (control devices)—screen blankers like Pyro, or function-key tools like QuicKeys. (Though CDEVs are sometimes lumped into the same general category as DAs, they are beyond the purview of this article. Same with their cousins, INITs—software tools that install themselves upon booting.)

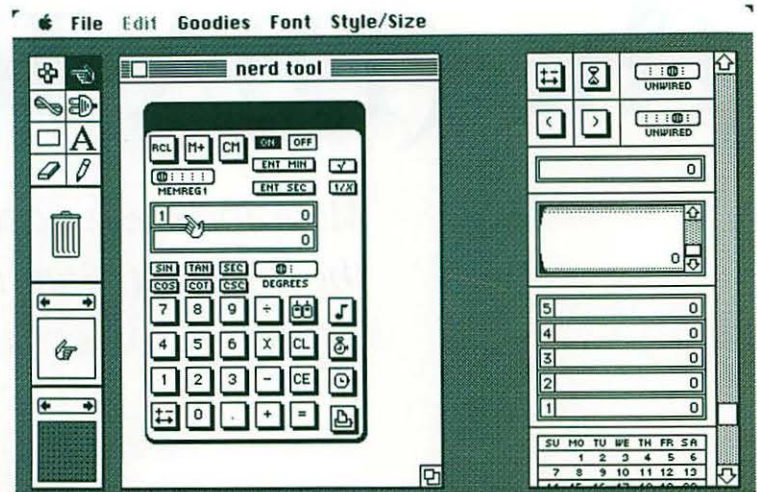
The **Alarm Clock** that comes with the standard System has been a theme for endless software variations. DA artists have devised everything from sleek analog clock faces to digital readouts that cover the whole screen—there's even a Mac Mickey Mouse clock. For a while an INIT file called J-Clock was the rage, but it took up space on the menu bar and caused some ugly conflicts with other programs. All in all, I don't think it's worth the effort to seek out a better clock.

Another standard DA that you delete at your own risk is **Key Caps**. You probably won't use it much, since all it does is tell you what happens when you press a given key or combination of keys. But at those rare times when you need an umlaut, and you don't feel like five or ten minutes of mind-numbing trial and error to find the right combination of keys, Key Caps can instantly tell you where the umlaut hides. Of course, if you deal with a lot of fonts, especially weird ones that have many symbols, you're probably a Key Caps junkie already.

(If you find yourself in and out of an AppleTalk environment or shuttling between a laser printer and an ImageWriter, you're stuck with the unexciting but indispensable Chooser, a DA that popped out of nowhere one day to address a problem that never seemed to be there before the Chooser existed. Since this is such a boring DA, however, I'm not counting it among our dream team.)

Upgrading the Originals

From here on in, things get more interesting. Three of the more remarkable DAs that came with the original Mac are still useful but might bear replacing. First is the Calculator, a clever little representation of a hand-held electronic calculator that enables you to perform quick math functions from within a program. The introduction of arithmetic functions in word processors has not diminished the need for the Calculator, and even people with spreadsheets on screen find themselves pulling down that DA for quick computations. If your needs are basic, you can get by quite well with the one Apple supplies, but more extensive demands are easily met. The next step up is something like Calculator+, included in Borland's SideKick package (\$99.95). Besides the additional functions, Calculator+ gives you the equivalent of a tape readout for viewing what numbers you've already punched.



Under Construction

Calculator Construction Set enables you to build your favorite functions into a dream calculator of your own design. You can even set it up to be controlled from the keyboard.

Any number of more powerful calculators—such as dCad Calculator (\$19.95 shareware), loaded with arcane functions—are to be found on the nets. But the Cadillac of calculator DAs is **Calculator Construction Set** (\$89.95), which lets you build your own, with almost any function imaginable. Nerd heaven. An added advantage is having the ability to use the keyboard to punch the keys of your on-screen dream calculator.

While only some people will want to upgrade from Calculator, everyone can improve on Apple's zero-frills Notepad. I can't imagine using the Mac without a quick and easy way to create or capture text, edit it, and save it as a file—no matter what program you're using. To do this properly, you should upgrade to one of two turbo-notepads: either the public domain Mini-Writer, which has an avid following due to its speed, or my choice, the more substantial **MockWrite** (\$35). (Notepad+, included in SideKick, is a virtual clone of MockWrite.)

Yet another quantum improvement results from upgrading the Scrapbook desk accessory. You can turn a useful yet minimalistic tool into a full-featured luxury item with **SmartScrap** (\$69.95, includes The Clipper). Once this DA is installed, your single scrapbook becomes a library of scrapbooks, with any picture easily available via a visual table of contents. You can actually browse through miniatures of your graphics. And unlike the original DA, SmartScrap can store a full page of graphics, and it lets you select only a portion of the picture to paste into your document. Characteristic of second-generation DAs, SmartScrap extends power but doesn't fetter you with all the baggage of a full-blown application.

Hard Disks Made Easy

Hard disk owners need a DA to help them locate files buried in a folder within a folder—documents that time forgot, or at least forgot to name. Though many of us have kept it by force of habit, Apple's simple Find File is too simple; it finds, gives you the information, and takes a hike. Replace it with something more substantial. One of the best new DAs is **DiskTop** (\$49.95, includes Laser Status), which not only locates files in short order but lets you perform all sorts of hard disk-management tasks, such as moving and renaming files and changing their formats, from within an application.

Many of DiskTop's functions, of course, are less valuable now that you can use MultiFinder to switch out of an application and into the Finder to perform file-management tasks. But not all of us use Multi-

Finder, and on balance I think the extra chores DiskTop performs, and the ease with which it performs them, make it a valuable addition to the menu. The only thing it doesn't do that it should is launch files once it finds them. A DA that does this is HFS Locator Plus, which isn't as comprehensive as DiskTop but is a worthy alternative.

Searching *for* files is one thing, but what about searching *through* files? The DA **Gofer** (\$79.95) can search through thousands of pages of documents for a single phrase. Gofer is fast—it searched through a 15-file, 500-page manuscript of mine in about ten seconds—and its search functions are extensive. You can, for example, search using Boolean and wild-card variables. Gofer can search your entire hard disk from the desktop or from within a word processor, terminal program, or anything else.

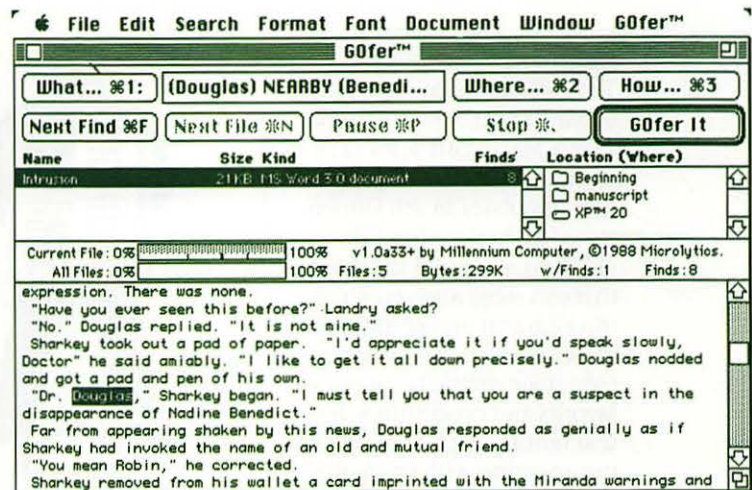
Applications Under the Apple

The second generation of DAs often gives you the power of a full application, squeezed down and streamlined so you can use it anytime. Some of them are so useful that they're worth having, despite the accessibility of big-brother applications under MultiFinder.

If you want to create graphics without dealing with a stand-alone paint program, for example, you'll be amazed at how effective **DeskPaint** (\$129.95) is—almost as powerful as the new MacPaint. With unique features like those that lighten or darken an image, DeskPaint is especially valuable for use with a page-layout program. Likewise, instead of booting up More, or using a clunky outlining function in a word processor, you can more than meet minor outlining needs

What We Use at Macworld

The *Macworld* editorial staff and contributors submitted to polygraph tests and disclosed the contents of their System files. Not surprisingly, many of the DAs we use are aids to the work we do putting out a magazine. Aside from the Apple DAs included in off-the-shelf Systems, the most popular desk accessory among our editors is Acta—it's on eight Systems and was cited four times as being among the favorite DAs. Runner-up was Word Finder, a capable thesaurus (seven Systems, three favorites). SmartScrap, DeskPaint, QuickDex, DiskTop, Suitcase, and Calculator+ all rated high. MiniWriter beat out MockWrite as the Notepad substitute of choice. Also mentioned repeatedly was WordCount, a public domain DA that counts words in text files. The DA with the highest satisfaction-rating was QuickDex. Of those who use it, all said it was one of the most useful.



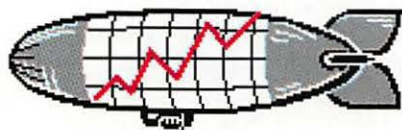
Neat Seeker

Gofer can search through all your text files to find a reference, or as shown here, any case where a word appears twice within a few lines. The program is convenient and fast.

Special Teams

Networking/Graphics

Gary Cosimini is in charge of the Macintosh network at the *New York Times*, as well as a connoisseur of DAs. He calls the Laser Status utility, which keeps him aware of the current printing situation, "very very useful." Timbuktu (\$99.95 and up, depending on size of network), a DA that enables Cosimini to take over another computer on the net, is a valuable aid when one network node or another gets stuck. For moving graphics around, Cosimini uses Artisto, a public domain utility (contribution requested), to copy bitmaps into the Clipboard and save them as PICT files.



Business

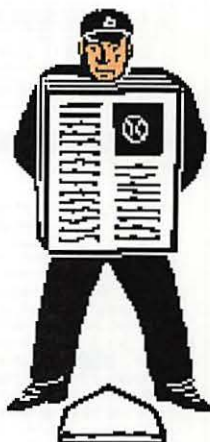
Tony Oppenheim is a business consultant in New York who uses a Macintosh. A lot of his work involves developing custom templates in 4th Dimension. He thinks AffiniFile (\$79.95), a tiny DA database that can store and search through text and graphics, is a boon. He also uses SmartScrap (see main article) to store 4-D layouts and procedures. For text editing, he has been experimenting with the feature-



laden Joliwrite (\$20), a French import. He is impressed with the spreadsheet-in-a-DA Bi-Plane (\$40), but since his Mac is loaded with memory, he winds up using Excel under Multi-Finder instead.

Page Layout

Randy Tibbott is a desktop publishing consultant, graphic artist, and PageMaker wizard. The DA he swears by is SmartScrap, included in our DA dream team, which he uses not only for graphics but also to save kerned text, particularly headlines. He manages an astronomical number of fonts with



Font/DA Juggler (\$59.95), and composes notes with the Notepad+ from the SideKick assortment of DAs (\$99.95). When he needs screen shots, "especially when it won't work from the keyboard," he uses Camera, a freeware DA that specifically addresses that function.

Programming

Adam Wildavsky programs Macs for Tradenet in New York. He recommends several DAs to make the programmer's job easier. His favorite seems to be the Browser (distributed free to members of Apple Programmer's and Developer's Association): "It lets you look at source code more easily." He uses Disktools II (\$49.95, part of Disktools Plus) to ascertain the creator and file type of a given file. He also suggests The Programmer's Online Companion (\$34.95), an online abridgement of *Inside Macintosh*, the programmer's bible; System Errors DA, a public domain quick guide to bomb reports; the multifunction dCad Calculator (\$19.95 shareware); and HeapShow (\$79), which gives detailed information on a program's innards.



with a DA like **Acta** (\$79), which creates nifty outlines that you can refer to any time. This is especially handy when you use outlines for "to do" lists or as small-scale project organizers.

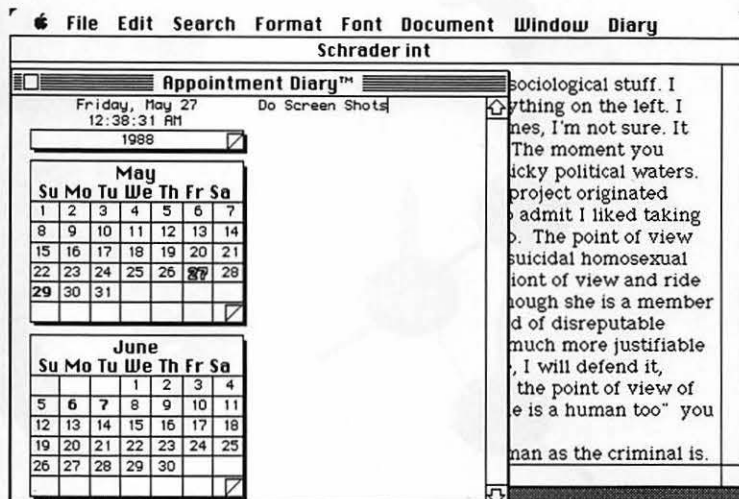
The Organization DA

In fact, DAs seldom shine as much as when they help organize your life. Despite intricate super-Filofax-type programs like Focal Point, the promise of HyperCard as a private-secretary substitute is as yet unfulfilled—that strategy requires too much memory and is too slow to provide details on command. A much better alternative is a combination of DAs, centered around the acme of the field, a marvel called **QuickDex** (\$49.95). This not only fulfills the function of a Rolodex—storing an unlimited number of names, numbers, and addresses—but it acts as a sturdy little mailing-list database, with search functions and printing capabilities. Its speed is breathtaking, and it dials phone numbers for you. Once you install it, you can't live without it.

You can get further organized with a package of two DAs called **Smart Alarms** and **Appointment Diary** (\$49.95 for the pair). The former allows you to program messages to yourself; at the times you specify, the Mac reminds you to call your broker, go to the dentist, or prepare your expense report. The latter is a detailed appointment book that keeps track of your schedule. When the two DAs are used in tandem, you can program reminders far in advance (three days before your mother's birthday, the Mac can remind you to send her a card—not only this year but in 1989).

Moving Around

Another DA for all seasons is **Tempo II** (\$149.95). This macro-making utility allows you to create all sorts of shortcuts to get your work done quicker, and the



It's a Date

A calendar in Appointment Diary. The combination of this DA with Smart Alarms, which puts messages on your screen at preset times, is almost as good as having an administrative assistant.

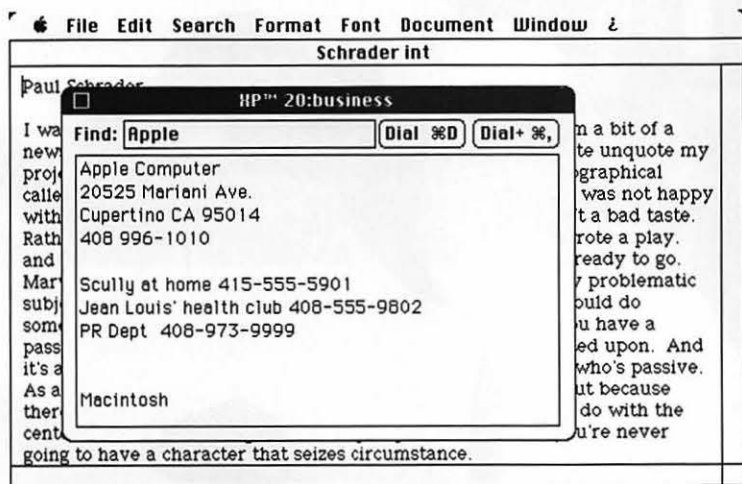
new version makes the most of MultiFinder to let you automate tasks using several applications. For instance, you can set things up so you can call up QuickDex, or any other DA, with a keyboard command instead of a mouse operation. Though the latest version of Apple's System software supposedly includes a macro tool, it is doubtful that this new release (not seen at press time) will have features comparable to Tempo II.

The final spot on our menu goes to **Suitcase** (\$59), a desk accessory that cleverly allows you to raise the 15-DA ceiling and stuff your System with dozens more. Suitcase is also invaluable to those who use a lot of fonts, since it can hold font families in separate files, to be called up as needed. (See the sidebar "Avoiding Font Menu Overload" in the April 1988 *Macworld* article "Fit to Print" for tips on font management using Suitcase.)

With Suitcase, you don't have to make the difficult decision about which DA to cut every time you come across a new one. You'll have room for indispensable little DAs like Kiwi Envelope (\$8), which does nothing but allow you to print envelopes easily (unlike any word processor known to humankind). Or HyperDA (\$69), which allows HyperCard users to browse through stacks without opening the memory-gobbling application itself.

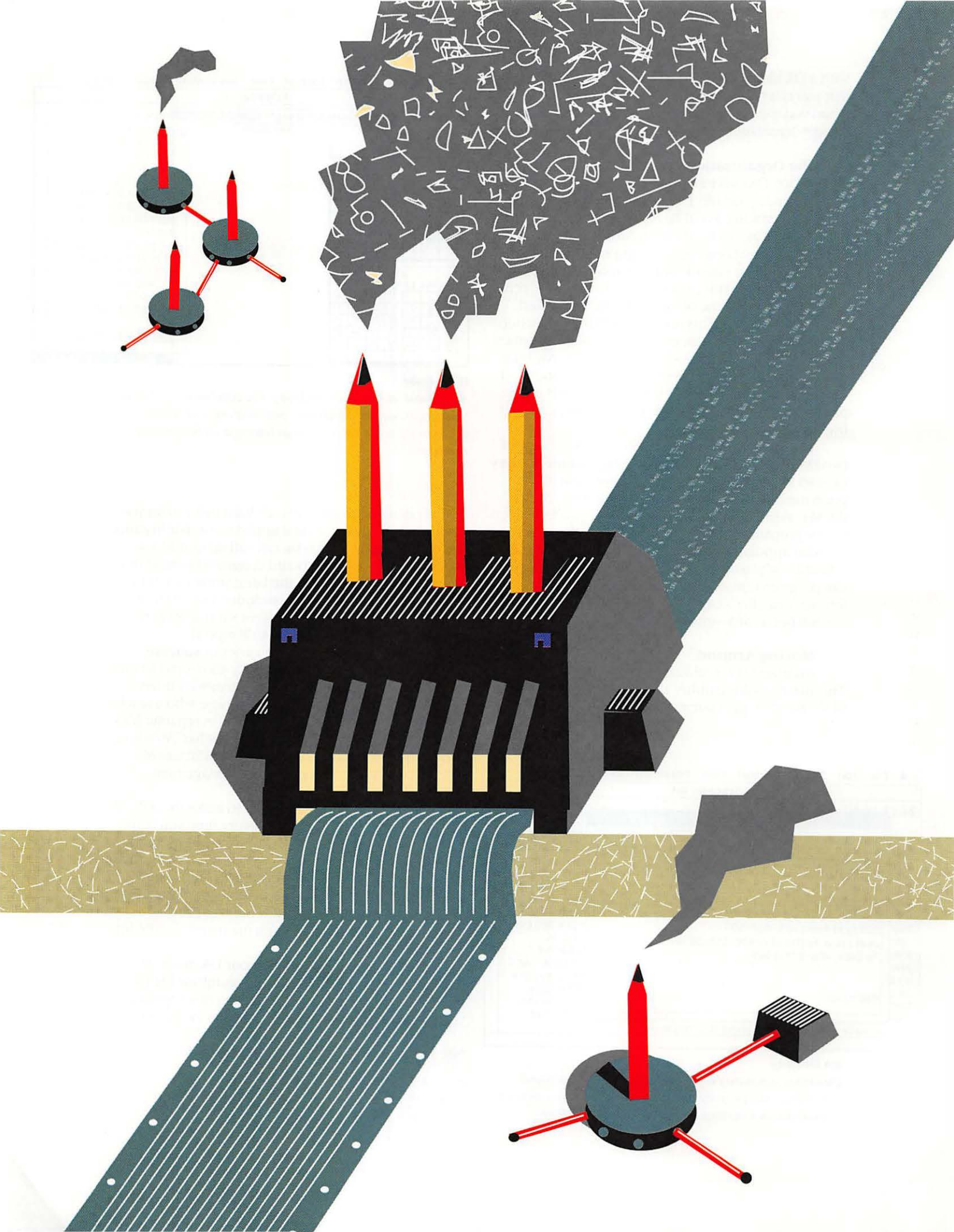
So there's no need to limit your DA menu. The only thing holding you back from plumbing the productive world of desk accessories is your imagination, your pocketbook, and your willingness to explore. □

See *Where to Buy* for contact information.



DA Dialing

QuickDex is a luxury computer Rolodex with fast search capabilities and printing powers that allow you to use your address file as a mailing list. It even dials your phone.



Who Keeps the Books?

Selecting an accounting package that fits your business



by Alan L. Slay

Finding a good accounting program is really a matter of finding one that accommodates the scope of your business and fits your current accounting procedures. Although most Macintosh accounting packages offer the basic functions of general ledger and accounts payable and receivable, they address different accounting requirements and preferences. It is difficult, if not impossible, to compare a feature-laden multiuser program like Multi-User Desktop Accounting to a one-write program like Plains & Simple OneWrite. So we've divided the accompanying tables into three product categories to help you compare features among representative groups of programs.

■ **Modular** A traditional approach to accounting that posts transactions periodically by batches; each ledger is a separate module.

■ **All-in-one** An ongoing entry system that combines several ledgers in one integrated program, including at least general ledger, accounts payable, and accounts receivable.

■ **Special function** Specialized programs that automate payroll, point-of-sale, or inventory records.

Although omitted from this overview, personal financial and template programs are sometimes adequate for small businesses whose accounting requirements can be handled within that format.

Personal finance programs, such as Dollars and Sense, Macmoney, and Managing Your Money, focus on personal financial planning and investment rather than business accounting. Check-writing programs such as Intuit's Quicken can be used by businesses that don't want to perform any kind of bookkeeping function but want to automate check writing and maintain records that can be handed over to a bookkeeper or an accountant.

There are numerous template programs, and they vary considerably in quality. Most templates developed for spreadsheet programs (such as Microsoft Excel) or databases (such as Omnis) are not comparable to full-featured accounting programs and usually require the additional purchase of the underlying software. Although technically Multi-User Desktop Accounting and Payroll Bridge are templates, we've included them because they have a fully developed set of modules, they come with run-time versions of Omnis 3 Plus,

and they're sold nationally through regular distribution channels.

The accounting records you keep for your business contain information critical to you, your accountant, and state and federal agencies. I highly recommend that you involve your accountant or bookkeeper throughout the process of selecting a suitable program. After assessing your accounting needs, evaluate the features listed on the three accompanying tables: General Accounting, Payroll, and Inventory. The General Accounting table covers aspects of accounting, including general ledger, accounts payable, and accounts receivable, supported by most programs. The Payroll table and Inventory table cover only programs that provide these more specialized capabilities.

Modular Accounting Programs

The first category on the tables covers nine modular programs. A modular product contains separate programs for each ledger or specific application, such as accounts receivable (A/R) or order entry. The separate modules supply data to a central

Alan L. Slay is a freelance writer based in St. Louis; he specializes in financial and accounting software.

general ledger (G/L) through batch posting.

Modular programs are geared to the stand-alone bookkeeping operation. Nearly all the programs in this category emphasize traditional accounting procedures. For example, most programs provide extensive features for hard-copy audit trails. As the name suggests, you can buy individual modules as the need arises. The programs in this category occupy at least one 800K disk. In most cases you will need a 20-megabyte hard disk, preferably 40MB or more, to run multiple modules.

The most versatile modular program listed is Microfinancial Corporation's Flexware, a multiuser accounting package that operates on the Mac, the IBM PC, and VAX

roll Bridge, that feeds data into its G/L. Payroll Bridge, which also runs on Omnis, is expensive, however, when you consider the performance and prices of its payroll competitors.

Some modular programs—Lake Avenue Software's The Assistant Controller, Small Business Technology's (SBT's) Database Accounting Library, and Great Plains Software's Great Plains Accounting Series—originate from MS-DOS programs. The Assistant Controller and the SBT Database Accounting Library run on McMax, a Macintosh database management program that is compatible with Ashton-Tate's dBase software running on MS-DOS computers. Great Plains has done the best job of adapting itself to the Mac, but don't expect to wear out your mouse using it. These programs benefit from the experience their manufacturers gained in the PC market, and include many improvements based on user recommendations. They also offer more additional specialized modules than the other modular programs (see "Additional Modules").

Two modular programs that make good use of the Mac's interface are Layered's Insight and Chang Labs' Rags to Riches. Insight works in ledger-card formats. Information is immediately accessible, so you do not have to create a report first in order to review and edit data. The program also includes *interpretation* screens, which tell you what the numbers in your company books mean. For example, one explains current ratio. The G/L, A/P, and A/R modules are fast and smoothly integrated. Layered offers a separate module for exporting data, and plans to release an inventory module soon.

Rags to Riches takes a conventional approach to bookkeeping while offering one of the Mac's most imaginative interfaces. The user clicks into and out of the various detail, ledger, and summary screens. Instead of posting directly to the G/L, the program provides a separate merge file that is transferred to the G/L at a later time—a useful feature if the ledger and G/L are on separate machines. In addition to the basic modules, Rags to Riches offers an Inventory module and a Professional Billing module for consultants and service businesses.

All-in-One

All-in-one programs integrate G/L, A/R, and A/P, and in some cases payroll and inventory. Most all-in-one programs differ from modular programs in the way they re-

	Regular	OverTime	DayTime	Sick	Vacation	Optional
Anderson, John	0.00	0.00	0.00	0.00	0.00	0.00
Black, Jonathan	0.00	0.00	0.00	0.00	0.00	0.00
Johnson, Tim	0.00	0.00	0.00	0.00	0.00	0.00
Smith, Adam	0.00	0.00	0.00	0.00	0.00	0.00
Wilson, Roger	0.00	0.00	0.00	0.00	0.00	0.00

CheckMark MultiLedger

CheckMark Payroll's entry screen lets you enter hours for all employees on a single screen. This convenient feature can save you the trouble of working through individual employee screens—a useful feature for any business which has varying hours each pay period.

minicomputers. Flexware is expensive compared to other Mac accounting programs, but it rivals minicomputer programs costing a good deal more. One Flexware user has 17 Macs set up on a network performing point-of-sale (POS) processing, invoicing, job costing for bids, inventory management, scheduling, and several other business applications.

Another multiuser program is Circo Business Solutions' Multiuser Desktop Accounting (MDA). MDA's overall appearance and operation will be familiar to Omnis 3 Plus users, and it includes a run-time version of that database manager. MDA does not include a payroll package, but you can purchase a separate payroll processor, Pay-



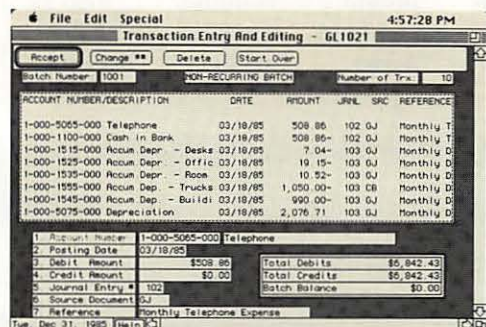
quire you to enter and retrieve data. Instead of closing transactions and posting them by batch, the program automatically posts each transaction or adjustment as soon as the entry screen is closed. This interactive approach to recording transac-

Flexware

Microfinancial Corporation's Flexware offers a wide range of applications and features. The program allows file sharing between users in the Macintosh, MS-DOS, and VAX environments.

tions takes less time and makes up-to-the-minute reports available.

All-in-one programs are less expensive than separate modules, and are adequate for the needs of many small businesses. These programs are best suited to



Great Plains Accounting Series

Great Plains Software has done one of the best jobs of translating MS-DOS programs into the Mac environment. The publisher's experience in the MS-DOS world is evident in the range and depth of its applications.

the bookkeeper or owner/manager/bookkeeper who doesn't want to bother with procedures like proofing batches in hard copy before posting.

All-in-one programs vary in sophistication and design. For example, CheckMark Software's CheckMark MultiLedger is included in the Payroll table because it has one of the best payroll modules for feeding detailed data into the G/L. But the design of the G/L, A/P, and A/R modules fits the all-in-one definition.

CheckMark Payroll stores only the most basic information on each employee and provides basic payroll reports. However, anyone who can work across and down the self-explanatory menus can do a payroll quickly and easily with little reference to the documentation. Setting up more complicated tables, such as tax tables, is more difficult. For businesses with high employee turnover and varying work hours each pay period, the use of a single entry screen to record all employee hours is a plus. This feature makes data entry much faster than entering hours in individual employee records.

Monogram's Business Sense and Bedford Software's Simply Accounting use desktop icons to represent the various ledgers and journals. To make an A/P entry, for example, you click on the A/P or Purchases

icon and work within that journal; the menus provide the various activity options. When you return to the desktop, the program automatically posts the entries to the G/L.

Simply Accounting comes with federal and state payroll tax tables, which you purchase from Bedford Software in an annual update. Business Sense's payroll tax tables are entered by the user, although Monogram will sell you a complete set of updated federal tables. (My advice is to get them and save a lot of detailed work.) Monogram does not, however, offer state tax tables.

Softsync's Accountant, Inc., Computer Associates' BPI Entry Series, Migent's In-House Accountant, and Layered's Insight OneWrite operate in batch rather than on-line mode, but vary in degree of sophistication. Accountant, Inc., and BPI would likely fit a bookkeeper's accounting requirements, while Insight OneWrite and In-House Accountant would better accommodate the owner/manager who is keeping records that will eventually be processed by a bookkeeper or an accounting service.

Accountant, Inc., uses a form-structured approach to data entry. You select your general function (journal entries, for example) from the menu bar, and then en-

Best Impressions

After spending countless hours looking at all the accounting programs covered in this article, I developed some personal favorites. Although this overview doesn't constitute a comparative review, it's difficult not to form some opinions in the process. Keep in mind that my observations are based on initial exposure to the products, rather than exhaustive testing.

My favorite all-around accounting program is CheckMark Software's MultiLedger/Payroll set. It was the simplest and most logical program I examined that provided a rea-

sonably full set of accounting capabilities. Its price/performance ratio represents an excellent value.

If I were a full-time bookkeeper/accountant, I would invest in the Insight Accounting Series. Although the series will not begin to realize its full potential for a couple of years, Layered has committed itself to a high-quality product that makes excellent use of the Mac's interface.

In terms of documentation, packaging, support material, and program appearance, I was most impressed with the Great

Plains Accounting Series. All the materials and screen displays are attractive and polished—first-class in every way.

In range of application offerings, I must congratulate SBT Corporation. My personal preferences tend away from programs based on dBase, because of inherent speed limits in their present design. But SBT's many years of experience working with a wide range of small businesses is evident in the variety of specialized applications the company offers.

General Accounting

Modular Programs

All-in-one Programs



**The Assistant
Controller
Accounting
Series**



**Checkmark
MultiLedger**



Flexware



**Great Plains
Accounting
Series**



**Insight
Accounting
Series**



**Multiuser
Desktop
Accounting**



**Rags to
Riches
Accounting
Series**

Vendor	Lake Avenue Software	CheckMark Software	Microfinancial Corporation	Great Plains Software	Layered	Circo Business Solutions	Chang Labs
Version	5.1	1.03 (P/R-2.0)	6.0	4.2	2.1	2.01 demonstration disk	3.1
Package price (includes)	n/a	\$395 (G/L, A/R, A/P, inventory)	n/a	n/a	n/a	\$1795 for 1 user (G/L, A/R, A/P, inventory P/O entry, POS, sales)	\$499.95 for 3-pack (G/L, A/R, A/P)
Multuser price	n/a	n/a	Module—\$795	Network Manager—\$795	A/R, A/P—\$895 each	\$2595—\$3595	\$499.95 for 3-pack
Network(s) supported			TOPS, AppleShare, Macserver	TOPS, AppleShare	TOPS, AppleShare	TOPS, AppleShare, DEC-Serve, 3Com	AppleShare
Maximum concurrent users			99	unlimited	16	32	1 per module
Minimum memory required	512K	512K	1MB	512K	1MB	512K	512K
Cash, accrual, fund	c, a	c, a	c, a	c, a, f	c, a	a	c, a
One-write, double entry	double	double	double	double	double	double	double
Sample data included	•	•	•	•	•	•	•
Moves data between ledgers	•	•	•	•	•	•	merge file
Imports data	•	•	•	•	•	•	•
Exports data	•	•	•	•	•	•	•
Password protection	•	•	•	•	•	•	•
Maximum depts./profit centers	999	9	99	999/36	999/256	33	99
Free telephone support	30 days	unlimited		30 days	30 days		90 days
Toll-free support number				•	•		•
Help screens			•	•	•		•
Budgeting capability	•	•	•	•	•	•	
GENERAL LEDGER							
Module price—separate	\$595	included	\$795	\$795	\$595	included	\$199.95
Maximum entry amount	\$99,999,999.99	\$9,999,999.99	\$9,999,999.00	\$999,999,999.00	\$999,000,000.00	\$99,999,999.99	unlimited
Maximum transactions	limited*	limited**	limited*	limited*	limited*	limited*	limited**
Maximum bank accounts	999	unlimited	in A/P module	limited*	limited*	5 checking	limited*
Maximum lines per transaction	limited*	limited**	999	limited*	limited*	limited**	debit, credit
Chart of accounts							
sample set provided		•	•	•	•	3	•
maximum accounts	80,000	limited**	99,999	limited*	limited*	limited*	limited*
maximum digits	8	5	5	11	11	limited*	14
alphanumeric	numeric	numeric	alphanumeric	alphanumeric	numeric	alphanumeric	alphanumeric
Processing	batch	batch, online	batch, online	batch	batch	batch	batch, online
Automatic reversals		•	•	•	•	•	
Prints checks direct from G/L		•				•	
Flexible fiscal periods	•	•	•	•	•	•	•
Enter future trans. (curr. yr.)	•	1 period	•	+ next year	•	•	•
Enter prior-period transaction	•	•	•	•	only if open	•	•
Recurring/automatic entries	•	•	•	•	•	•	•
Reconciled checking accounts on screen	•	in A/P module	•	in A/P module		•	•

* Limited by disk space. ** Limited by memory.



**SBT Database
Accounting
Library**



**WOS Fund
Accounting**



**Accountant,
Inc.**



**Back to
Basics
Professional
Accounting**



**Simply
Accounting**



**BPI Entry
Series
Accounting
Computer**



**Business
Sense**



**In-House
Accountant,
Inc.**



**Insight
OneWrite**



**Plains &
Simple
OneWrite**

Small Business Technology 6.10, 6.15	WOS Data Systems 2.25	Softsync 2.1	Peachtree Software 2.0	Bedford Software 1.0	Associates Int'l 1.0	Monogram 1.0	Migent Inc. 1.05	Layered 1.0	Great Plains Software 1.02
n/a	\$5995 (G/L, A/R, A/P, P/R)	\$299.95 (G/L, A/R, A/P, inven- tory)	\$199 (G/L, A/R, A/P invoice)	\$349 (G/L, A/R, A/P, P/R, Inven- tory/job cost)	\$89 (G/L, A/R, A/P, P/R)	\$495 (G/L, A/R, A/P, P/R job cost)	\$199 (G/L, A/R, A/P, inventory limited PR)	\$299 (G/L, A/R, cash disburse- ment)	\$395 (G/L, A/R, A/P)
n/a	\$5995	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Novell, TOPS, AppleTalk, Cor- vus, Omninet 45								
512K a double	512K f double	Plus c, a double	512KE c, a double	1MB a double	512K c, a double	512K c, a double	7512K c, a, f double	512K c one-write	512K c, a, f one-write
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
999 unlimited	limited*	1 30 days	10	1000	10 60 days	99 45 days extra cost	unlimited	99 30 days	30 days
•	•	•	•	•	•	•	•	•	•
dLedger \$395	\$1695	n/a	included	included	included	included	included	included	included
\$99,999,999.99	\$99,999,999.99	\$99,999,999.99	\$999,999.99	\$9,999,999.99	\$9,999,999.99	\$999,999,999	\$99,999,999.99	\$999,999	\$9,999,999
16 million/PD	limited*	limited**	4500	limited*	limited*	limited*	unlimited	limited*	limited*
in dPayables	limited*	limited**	3	limited*	1	5	200	1	limited*
99,999	999	limited**	21	255	12	limited*	50	100	limited*
•	•	•	•	•	•	•	•	•	•
99999	limited*	limited**	245	1000	8000	2000	limited**	58	limited*
8	29	5	4	4	4	8	4	6	6
alphanumeric batch	alphanumeric online	alphanumeric batch	numeric online	numeric online	numeric batch	numeric online	alphanumeric online	numeric batch	numeric online
•	•	•	•	•	•	by menu choice	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	only if open	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•

General Accounting

Modular Programs



**The Assistant
Controller
Accounting
Series**



**Checkmark
MultiLedger**



Flexware



**Great Plains
Accounting
Series**



**Insight
Accounting
Series**



**Multiuser
Desktop
Accounting**



**Rags to
Riches
Accounting
Series**

Reports							
screen, disk, graphs	s, d	s, d, g	s, d	s, d	s, d, g	s, d	s, d
trial bal., bal. sheet, inc. statement	•	•	•	•	•	•	•
journal transactions for period	•	•	•	•	•	•	•
journal transactions—YTD	•	•	•	•	•	•	•
forecasts			•	•		•	
ratios and data interpretation				extra cost	•		•
custom reports	extra cost		•		•	•	
ACCOUNTS PAYABLE							
Module price—separate	\$595	included	\$795	\$795	\$595	included	\$199.95
Maximum vendors	limited*	limited**	limited*	limited*	limited*	limited*	limited*
Maximum entry amount	\$99,999,999.99	\$99,999,999.99	\$999,999.00	\$9,999,999.99	\$999,000,000.00	limited*	limited**
Maximum transactions	limited*	limited**	limited*	limited*	limited*	limited*	limited*
Maximum lines per transaction	limited*	unlimited	999	102/invoice	15	limited**	limited*
Enters prior-dated invoices	•	•	•	•	•	•	•
Automatic recurring transactions	•	•	•	•	•	•	
Tracks by due dates	•	•	•	•		•	•
Stores transactions by							
invoice number	•		•	•	•	•	•
assigned document number	•	•		•	•	•	•
date	•	•		•	•	•	•
Allows onetime vendors	•	•		•	•	•	•
Carries over unpaid entries	period, year	period, year	period	period, year	period, year	period, year	period, year
Batches invoices for payment			•	•	•	•	•
Allows partial payments	•	•	•	•	•	•	•
Allows manual checks	•	•	•	•	•	•	•
Calculates discount	•	•	•	•	•	•	•
Check Printing							
Single check for multiple transactions	•	•	•	•	•	•	•
User-defined memo/message on check	•	•	•	•		•	•
Vendor address	•	•	•	•	•	•	•
Reports							
Screen, disk, graphs	s	s, d, g	s, d	s, d	s, d, g	s, d	s, d
Detailed YTD vendor transactions	•	•	•	•	•	•	•
Aged A/P reports	•	•	•	•	•	•	•
Custom reports			•		•	•	
Mailing labels		•			•	•	•

* Limited by disk space.

** Limited by memory.



**SBT Database
Accounting
Library**



WOS Fund Accounting



**Accountant,
Inc.**



Back to Basics Professional Accounting



Simply Accounting



**BPI Entry
Series
Accounting
Computer**



Business Sense



**In-House
Accountant,
Inc.**



**Insight
OneWrite**



Plains & Simple OneWrite

				Accounting		Computer				
	s, d	s, d	s, d	s, d	s, d	s, d	s, d, g	s, d, g	s, d	s
	•	•	•	•	•	•	•	•	•	•
	•	•	•	•	•	•	•	•	•	
	•	•	•		•	•	•	•	•	•
	•		•				•			
	•	•	•		partial				limited	
	dPayables \$395	\$1300	included	included	included	included	included	included	Cash disburse- ment included	included
	limited*	limited*	limited**	300	1000	2000	2000	limited**	limited*	limited*
	\$999,999,999.99	\$999,999,999.99	\$99,999,999.99	\$999,999.99	\$9,999,999.99	\$9,999,999.99	\$999,999,999.00	\$99,999,999.99	\$999,999.00	\$9,999,999.00
	16 million	limited*	limited**	1200	limited*	limited*	limited*	unlimited	limited*	limited*
	unlimited	999	limited**	15	99	12	unlimited	50	4	limited*
	•	•	•	•	•	•	•	•	invoices	•
	•	•	•	•			•	•		•
		•	•	•				•		
	yes + vendor	•	•		•		•	•	•	by vendor
	•			•	•		•	•	•	
	period, year	period, year	period, year	period, year	period, year	period, year	period, year	period, year		period, year
	•	•	•	•	•	•	•	•		•
	•	•	•	•	•	•	•	•		•
	•	•	•	•	•	•	•	•	•	•
	•	•	•	•			•			
	•	•		•	•	•	•			•
		•	•					•		•
	•	•	•	•	•		•	•	•	•
	s, d	s, d	s, d	s, d	s, d		s, d, g	s, d, g		s
	•		•	•	•		•	•		•
	•		•	•	•		•	•		•
	•	extra cost	•							
	•	extra cost	•	•			•	•		•

General Accounting

Modular Programs

All-in-one Programs



The Assistant
Controller
Accounting
Series



Checkmark
MultiLedger



Flexware



Great Plains
Accounting
Series



Insight
Accounting
Series



Multiuser
Desktop
Accounting



Rags to
Riches
Accounting
Series

	The Assistant Controller Accounting Series	Checkmark MultiLedger	Flexware	Great Plains Accounting Series	Insight Accounting Series	Multiuser Desktop Accounting	Rags to Riches Accounting Series
ACCOUNTS RECEIVABLE							
Module price—separate	\$595	included	\$795	\$795	\$595	included	\$199.95
Maximum customers	limited*	limited**,**	limited*	limited*	limited*	limited*	limited*
Maximum entry amount	\$99,999,999.99	\$99,999,999.99	\$999,999.00	\$9,999,999.99	\$99,000,000.00	limited*	limited**
Maximum transactions	limited*	limited**,**	limited*	limited*	limited*	limited*	limited*
Maximum lines per transaction	limited*	unlimited	999	102/invoice	15	limited**	limited*
Enter prior-dated invoices	•	•	•	•	•	•	•
Automatic recurring transactions	•	•	•	•	•	•	•
Tracks by due dates	•	•	•	•	•	•	•
Automatic invoice numbering	•	•	•	•	•	•	•
Carries over unpaid entries	period, year	period, year	period	period, year	period, year	period, year	period, year
Partial payments applied	•	•	•	•	•	•	•
Calculates sales tax	•	•	•	extra cost	•	•	•
Calculates finance charges	•	•	•	•	•	•	max 2 rates
Customer credit limits	•	•	•	•	•	•	•
Allows onetime customers	•	•	•	•	•	•	•
Allows invoice adjustments	•	•	•	•	•	•	•
Tracks sales by salesperson	•	•	•	•	•	•	•
Tracks sales commissions	•	•	•	•	•	•	•
Separate bill to/ship to	•	•	•	•	•	•	•
Reports							
Screen, disk, graphs	s, d	s, d, g	s, d	s, d	s, d, g	s, d	s, d
Detailed YTD customer transactions	•	•	•	•	•	•	•
Aged A/R reports	•	•	•	•	•	•	•
Custom reports	•	•	•	•	•	•	•
Customer invoices	•	•	•	extra cost	•	•	•
Customer statements	•	•	•	•	•	•	•
Mailing labels	•	•	•	•	•	•	•
Dunning letters	•	•	•	•	•	•	•

* Limited by disk space.

** Limited by memory.



**SBT Database
Accounting
Library Small
Business**



**WOS Fund
Accounting**



**Accountant,
Inc.**



**Back to
Basics
Professional
Accounting**



**Simply
Accounting**



**BPI Entry
Series
Accounting
Computer**



**Business
Sense**



**In-House
Accountant,
Inc.**



**Insight
OneWrite**



**Plains &
Simple
OneWrite**

dInvoice/ dStatements									
\$395	\$1000	included	included	included	included	included	included	included	included
16 million	limited*	limited**	400	1000	2000	2000	limited**	limited*	limited*
\$99,999,999.99	\$999,999,999.99	\$99,999,999.99	\$999,999.99	\$9,999,999.99	\$9,999,999.99	\$999,999,999	\$99,999,999.99	\$999,999.00	\$9,999,999.00
limited*	\$999,999,999.99	limited**	2000	limited*	limited*	limited*	unlimited	limited*	limited*
unlimited	999	limited**	10	99	12	unlimited	50	6	limited*
•	•	•		•	•	•	•	•	•
•						•	•		
•		•	•	•		•			•
•		•	•	•		•	•	•	•
period, year	period, year	period, year	period, year	period, year	period, year	period, year	period, year	period, year	period, year
•	•	•	•	•	•	•	•		•
•		•	•	•		•		•	
•	•	•	•			•		•	
•		•	•			•			•
•		•	•	•		•	•	•	
•		some		•		•	•		
•		•		•		•	•		
•		•	•	•		•			
•		•	•	•		•			
s, d	s, d	s, d	s, d	s, d		s, d, g	s, d, g	s	s
•		•	•	•		•	•	•	•
•	•	•	•	•		•	•	•	•
•		•		•		•	•	•	
•		•	•	•		•	•	•	•
•	•	•	•	•		•	•	•	•
•	extra cost	•	•	•		•	•	•	•
		•	statement message					statement message	

Payroll

Modular Programs



The Assistant Controller Series

CheckMark MultiLedger

Flexware








Great Plains Accounting Series

SBT Database Accounting Library

Vendor	Lake Avenue Software	CheckMark Software	Microfinancial Corporation	Great Plains Software	Small Business Technology
Version	5.1	1.03 (P/R-2.4)	6.0	4.2	6.15
Module price	\$595	\$295	\$795	\$795	dPayroll, \$395
Minimum memory required	512K	128K	1MB	512KE	512K
General Features					
Maximum employees	limited *	limited **	limited *	limited *	16 million
Maximum entry amount	\$999,999.99	\$99,999.99	\$999,999.00	\$9,999,999.99	\$999,999.99
Maximum income categories	4	3	99	2000	14
Maximum deduction categories		6	99	limited *	13
Calculation of pay	automatic	manual/ automatic	manual/ automatic	automatic	manual/ automatic
User-definable income categories	1	2	99	2000	3
User-definable deduction categories	8	6	99	limited *	8
Standard annual federal tax table	•	•	•	•	•
Maximum state tax tables	all	6	all	all	all
Pay periods provided	4	4	user defined	8	4
Allows nontaxable pay	extra cost	•	•	•	•
Allows taxable fringe benefits		•	•	•	•
Same screen to enter all employee hours		•			
Memo/note fields in employee record		1			
Inactive employee option	•	•	•	•	•
Prints checks	•	•	•	•	•
Reports					
Screen, disk, graphs	s, d	s, d, g	s, d	s, d	s, d
YTD and QTD earnings register	•	•	•	•	QTD only
Check register	•	•	•	•	•
Federal tax deposits	•	•	•	•	•
State withholding deposits	•	•	•	•	•
FUTA and SUTA	•	•	•	•	•
W-2 forms	•	•	•	•	•
Mailing labels		•		•	•

* Limited by disk space.

** Limited by memory.

		All-in-One Programs			Special Function Programs	
 						
WOS Fund Accounting	Simply Accounting	BPI Entry Series Accounting	Business Sense	In-House Accountant	Payroll Bridge	Aatrix Payroll
WOS Data Systems	Bedford Software	Computer Associates Int'l	Monogram	Migent	Software Bridge	Aatrix Software
2.25	1.03	1.0	2.25/1.0	1.05	5.0 and 4.0	3.01
\$2300	included	included	included	included	\$495	\$179
512K					512KE	512K
limited *	1000	2000	2000		limited *	limited *
\$99,999,999.99	\$9,999,999.99	\$9,999,999.99	\$999,999,999	\$99,999,999.99	\$99,999,999.99	\$9,999,999
limited *	6	1	10	999	limited *	3
limited *	9	1	10	999	10	8
automatic	manual/ automatic	manual	automatic	manual	automatic	automatic
	2		10	999	limited *	3
limited *	3	1	10	999	5	8
yes	•		extra cost		•	•
15	all		1		all	all
limited *	6	any	any		maximum 99/yr.	8
•	•	•	•		•	•
•	•		•		•	•
				1		1
•					•	•
•	•	•	•	•	•	•
s, d	s, d	s, d	s, d, g	s, d, g	s, d	s, d
•	•	•		•	•	•
•		•	•	•	•	in version 2.0
•	•		•	•	version 5.0 only	•
•	•		•	•	version 5.0 only	•
•	•		•	•	•	•
•	•		•	•	•	•
extra cost			•	•	•	

Inventory

Modular Programs



The Assistant Controller Series

CheckMark MultiLedger

Flexware Microfinancial

Great Plains Accounting Series

Insight Accounting Series

Vendor	Lake Avenue Software	CheckMark Software	Microfinancial Corporation	Great Plains Software	Layered
Version	5.1	1.03 (P/R-2.4)	6.0	4.2	2.1
Module price	\$595	included	\$795	\$795	\$595
Minimum memory required	512K	512K	1MB	512KE	1MB
Maximum items	limited *	limited *, **	limited *	limited *	limited *
Maximum transactions	limited *	limited *, **	limited *	limited *	limited *
Number of valuation methods	3	1	4	5	3
Number of costing methods	1	1	4	3	3
Supports standard costs	•	•	•	•	
Maximum digits					
item code	20 alphanumeric	30 alphanumeric	10 alpha	7 numeric	15 alphanumeric
cost per item	7 dig., 3 dec.	6 dig., 4 dec.	6 dig., 3 dec.	7 dig., 2 dec.	12 dig., 5 dec.
quantity on hand	7 dig., 1 dec.	5 dig., 3 dec.	3 dig., 3 dec.	6 dig., 3 dec.	12 dig., 5 dec.
price per item	7 dig., 3 dec.	6 dig., 4 dec.	6 dig., 2 dec.	7 dig., 2 dec.	12 dig., 5 dec.
Maximum suppliers per item	limited *	limited *	limited *	limited *	1 default, limited*
Maximum price types per item	3	1	9	9	5
Maximum costs per item	1	1	4	3	5
Allows inventory adjustments	•	•	•	•	•
Reports reorder point	•		•		•
Decimals					
maximum per cost	3	4	2	4	5
maximum per price	3	4	2	4	5
Calculates cost of goods sold	•	•	•	•	•
Tracks freight		•	•		in A/R
Tracks sales taxes		•	•	•	in A/R
Handles sales returns	•	•	•	•	•
Allows inventory transfers	•		•	•	•
Allows subassemblies			•	•	
Interfaces to sales/purchases	•	•	•	•	sales
Reports					
Prepares purchase orders			•	PO module	
Predefined reports			14	20	4
Custom reports			•		•



Multi-User Desktop Accounting

Rags to Riches Accounting Series

SBT Database Accounting Library

Accountant, Inc.

Simply Accounting

In-House Accountant

Circo Business Solutions	Chang Labs	Small Business Technology	Softsync, Inc.	Bedford Software	Migent, Inc.
2.01	3.1	6.10	2.1	1.03	1.05
included	\$399.95	included in A/R	included	included	included
512K	512K	512K			
limited *	limited *	16 million	limited **	2000	200
limited *	limited *	16 million	limited **	limited *	unlimited
4	1	1	1	1	0
4	1	1	2	1	0
•		•	•		
12 numeric	14 numeric	15 numeric	5 numeric	7 alphanumeric	30 numeric
9 dig., 4 dec.	14 dig.	7 dig., 3 dec.	6 dig., 3 dec.	6 dig., 3 dec.	8 dig., 2 dec.
9 dig., 4 dec.	14 dig.	7 dig., 3 dec.	5 dig.	6 dig., 3 dec.	5 dig.
9 dig., 4 dec.	14 dig.	7 dig., 3 dec.	6 dig., 3 dec.	6 dig., 3 dec.	8 dig., 3 dec.
1	limited *	limited *	1	1	limited **
30	1	3	1	1	1
5	1	1	1	1	1
•	•	•	•	•	•
•	•	•	•	•	
4	2	3	3	3	2
4	2	3	3	3	2
•	•	•	•	•	•
•	in A/P Module	•	•	•	•
•	max 2 raters	•	•	•	•
•	•	•	•	•	•
•	•	•	•	•	•
•	•	•	•	•	•
•	•	in dMaterials	•	•	•
•	G/L module	•	•	•	•
•	•	in dPurchase	•		
15	•	7	20	2	3
•		•	•		

ter the transactions on different forms. A major weakness of Accountant, Inc., is that it does not offer a payroll module at present. (Softsync plans to release a payroll module and network capabilities soon.)

Plains & Simple, an online accounting system, and Insight OneWrite, which uses cash disbursements instead of A/P, duplicate the one-write ledgers on the screen. The printed data or data on disk can then be processed later by a bookkeeper or an accounting service. These programs provide ledgers similar to manual one-write records, thereby reducing the learning curve for people who have been using this accounting method.

The BPI Entry Series Accounting program is essentially an electronic set of ledgers, with most of the work done manually. The program's \$89 list price is its main attraction.

A program intended for the non-bookkeeper is In-House Accountant, which uses one generic electronic form for all entries. The program appears fairly easy to use, and small-business owners who have not done manual accounting may find it easier

to learn than the one-write method.

Peachtree Software's Back to Basics: Professional program is currently scheduled for release, and is geared to consultants or professionals who sell services. It contains G/L, A/R, and A/P segments, with most of the emphasis on A/R and invoicing.

Special Function

The third category consists of programs that handle one or more accounting applications but do not have a G/L core. This category contains the payroll-only programs, along with ShopKeeper, which provides POS processing and A/R.

Aatrix Payroll is a good basic payroll program. One oddity, however, is that it saves each employee's records as a separate file, with the employee's name or code serving as a file name. This will strike those of us used to working with databases as highly unusual; but the process seems to work. In addition to offering Payroll version 3.01, Aatrix will soon introduce Aatrix Payroll Plus version 2.0. The new version will offer additional features, such as more income categories, special sections for res-

Additional Modules

Many of the accounting programs offer separate modules to handle specialized accounting needs. The following list covers vertical modules that can be purchased for the programs included in "General Accounting Table."

The Assistant Controller Accounting Series

Enhanced Reports	\$295
Order Entry/Invoice	\$595
Job Costing	\$595
Professional Time Billing	\$595
Point of Sale	\$795
Client Write-Up	\$995

CheckMark MultiLedger

Cash Ledger	\$195
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Flexware

Job Costing	\$795
Purchasing	\$795
Order Processing	\$795

Great Plains Accounting Series

Order Entry	\$795
Purchase Order	\$795
Executive Advisor	\$595

Insight Accounting Series

Insight Export	\$149
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Rags to Riches Accounting Series

Professional Billing	\$399.95
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SBT Database Accounting

dOrders	\$395
dPurchase	\$395
dAssets	\$395
dProject	\$395
dMaterials	\$395
dProfessional	\$395
dProperty	\$395
dMaintenance	\$395
dMenu/Backup	\$65

WOS Fund Accounting

Timbuktu	\$189.50-\$495
WOS Database	\$195-\$495
Detente Reports	\$189.50

Back-to-Basics: Professional Accounting

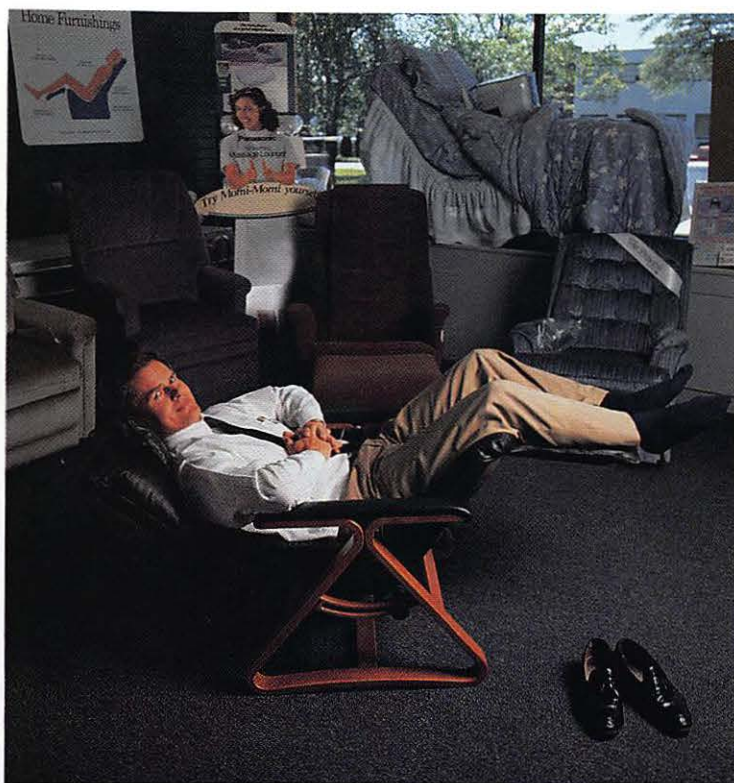
Separate Invoice Package	included
--------------------------	----------

taurants and contractors, and the calculation of accumulated sick pay and vacation based on hours worked.

Payroll Bridge is more expensive, but has a richer feature set, than Aatrix Payroll. Payroll Bridge comes with a run-time version of Omnis 3 Plus. The product's main appeal lies in its multiuser capacity and its ability to merge data into Circo's MDA program. Among its features is the ability to split pay for job costing, as well as a wide selection of employee and payroll reports.

Payroll Bridge's and Aatrix Payroll's features are compared to other programs on the Payroll table only.

It is difficult to compare ShopKeeper, from ShopKeeper Software, which does not appear in any of the tables, with other business accounting packages. ShopKeeper is an integrated program for retail or wholesale businesses that require inventory control. It features POS entry, inventory and cash drawer control, and billing and A/R. The program imports and exports data and supports up to 25 departments and/or profit centers. The publisher offers one year of free technical support.

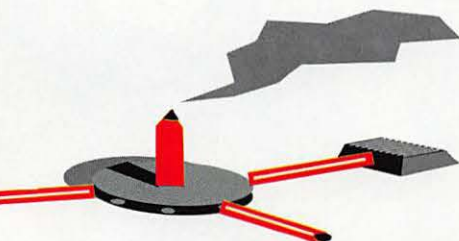


Back Accounts

John Gardner, co-owner of P. G. Back-belters, reclines in one of the many ergonomic products his company provides to help people reduce discomfort arising from back pain. He uses Rags to Riches to maintain his retail accounts because "it is simple to learn and easy to use."

Insight

Layered's Insight modules are designed specifically for the Mac environment, and it shows.



The program's capacities are well suited to a small business, and it produces all the standard reports, including customer invoices and statements.

A companion program to ShopKeeper, Bill-It contains most of ShopKeeper's features except inventory controls. It is intended for consultants, print shops, and other service businesses that need only a list of billable services or inventory items, along with general billing functions. ShopKeeper sells for \$195, and a multiuser version will be available soon for \$295. Bill-It costs \$159.

Take Your Choice

Which is the best program for your specific needs? If you have a bookkeeper or an accounting department, you should give serious consideration to the modular programs—but don't eliminate the all-in-one programs, since they might have the features and the capacity you want. If you are a combination owner/manager/bookkeeper or a part-time bookkeeper, evaluate the all-in-one programs. Examine the one-write offerings and In-House Accountant if you prefer to leave ledgers and journals to someone else.

Non-bookkeepers should look for programs that provide an ample number of reports. Reports offer immediate feedback

on your business, something you usually have to wait for an accounting service to supply on a quarterly or semiannual basis.

Special function programs and selected modules from the modular programs can save time on tasks such as payroll, billing, or bill-paying. In fact, you may find that a payroll program (especially one that feeds details into your G/L) costs less and gives you better control than using an outside payroll service.

The three accompanying tables provide a detailed look at the various accounting programs. Once you've narrowed your search, be sure to see a demonstration of the program before buying it. Ask your software salesperson specific questions, and if you can't get authoritative answers, call the publishers (listed in the *Where to Buy* section of this issue). And most important, don't forget to involve your bookkeeper or accountant in the decision process. □

See *Where to Buy* for contact information.

The author would like to thank Bob Taylor and Adrian Toole for their valuable accounting assistance during the preparation of the three features tables.

Drawing the Line

A pen-plotter primer

by David L. Peltz

You've already made the decision to use your Macintosh for computer-aided design (CAD). You know the Mac's advanced screen graphics and easy-to-use CAD software will do a great job in creating your engineering or architectural drawings. Now you face another decision—how to get your CAD drawings on paper.

Neither the LaserWriter nor the ImageWriter can handle the large-format drawings you need to produce. You could paste together a mosaic of 8½-by-11-inch LaserWriter output (as some architects do) to produce large drawings, and you know this method allows full use of Macintosh fonts and fill patterns, but you need color. So, like most CAD users, you've decided on a plotter. But which one?

The Plot Thickens

There are three types of plotters: electrostatic, dot matrix, and pen. Electrostatic plotters are similar to laser printers in con-

cept and output quality but use special paper and a different imaging technology. They are available in monochrome and color at up to 400 dots per inch (dpi), they're very fast, and they generally use continuous rolls of paper up to 36 inches wide. Electrostatics' main problem has been high cost—still as much as \$100,000. Prices are falling, but even the smallest electrostatics, at \$25,000 to \$30,000, are still beyond the reach of most Mac users.

Dot matrix plotters are outgrowths of dot matrix printer technology. The 27-pin Apple ImageWriter LQ, with its 216-dpi multicolor facilities, qualifies as an A- or B-size dot matrix plotter. However, no Mac CAD software currently supports its use as this type of device. The JDL-850EWS/GL+ Engineering Workstation Printer/Plotter is similar to the ImageWriter LQ but goes a few steps further. In addition to emulating a number of printers, its built-in microprocessor can emulate several Hewlett-Packard pen plotters. It does all this at 180 dpi, in up to 14 colors, on up to C-size pa-

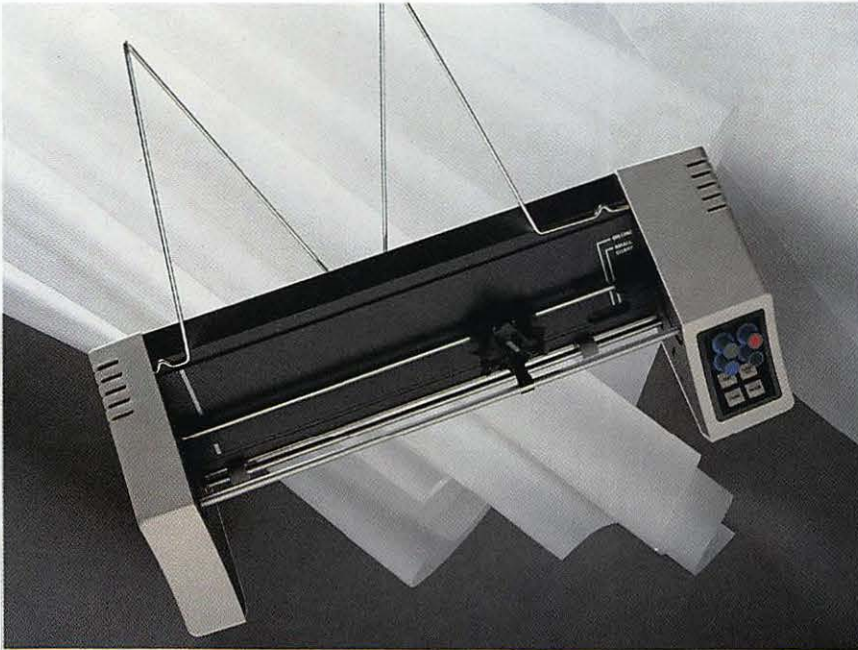
David L. Peltz is a Macworld contributing editor and the president of CADventures, a consultancy specializing in microcomputer graphics applications. He has been involved in the computer graphics industry since 1966.



per, using a 24-pin print head. The QMS-PS 810 laser printer can also emulate certain HP plotters.

For the production of inked drawings up to E-size, however, the pen plotter still reigns. For over 20 years, computer gurus have been predicting the extinction of pen plotters. It hasn't happened yet.

The basics of pen-plotter mechanism design haven't changed much over the years, though they have been greatly refined. Under computer command, the plotter's pen is lowered and raised. When down, it leaves a trail of ink on the medium. When up, it moves from one part of the medium to another without making a



The Houston Instrument PC-695A is a tabletop, four-pen plotter that easily fits in practically any workspace. Like numerous other pen plotters of its type, it provides accurate, low-cost, A- and B-size plots.

mark. Pens move in two ways. Flatbed plotters use vacuum or electrostatic means to hold the media stationary on a flat surface while the pen moves along both the x and y axes. Drum plotters use a grit drum that moves the medium back and forth along one axis while a rail moves the pen along the other axis. Because all flatbed plotters take up a lot of space, most offices can accommodate only the smaller models. For large-format drawings, drum plotters are more popular.

Another way to classify pen plotters is by the size of media they handle. If all you do is produce 8½-by-11-inch (A-size) or 11-by-17-inch (B-size) drawings, one of the tabletop models will meet your needs at a relatively low cost. However, if you produce larger drawings—from 17-by-22-inch (C-

size) through 36-by-48-inch (E-size)—you're going to need one of the more expensive, floor-standing plotters.

Floor-standing drum plotters come in two size classes, determined by the width of their mechanism. The smaller ones have a paper path just over 24 inches wide and handle A- through D-size paper. The larger ones have a paper path just over 36 inches wide and handle sheets of A- through E-size paper. A few also handle continuous rolls of paper.

The tabletop plotters come in A-size and A- through B-size. At least one (the HP 7550A, from Hewlett-Packard) stores 100 sheets of A-size paper in a drawer and can feed it automatically for unattended operation. The chart "Plotters Compared" lists the media size range accommodated by each plotter.

When the Chooser Doesn't

We Mac users have been spoiled by our elegant Chooser facility. We've come to expect to access all our output devices by simply pointing to an icon. Unfortunately, Mac plotter software hasn't yet achieved that level of sophistication.

Some CAD packages have their plot facilities in the File menu (where they belong). Others require you to exit the CAD application and launch a separate plot application from the Finder. Once you've gained access to your plot facilities, you'll find very different ways of determining what will get plotted, and where on the media it will end up. Some programs require you to hop from menu to menu, typing in numbers along the way. All too often, what you end up with after a long plot session is not what you wanted.

Why is it so unMaclike? Apple didn't provide any Chooser facilities for plotters, nor did it set any standards. So each software developer did what it felt was best. The result, sadly, reminds me all too much of the MS-DOS world, where the same lack of commonality prevails. It's never too late, though, and according to Apple's evangelism group, the company is now at least looking into addressing the problem. In addition, now that plotter manufacturers are becoming more interested in the Mac market, some are seriously looking at Chooser-level plotter drivers as an aid in selling their plotters to Mac users. At this writing, CalComp has a driver in beta testing. Others are rumored.

Before you buy a plotter, you should make sure that the Mac CAD software you use can drive it. This requires a driver,

which may be in the CAD software itself or part of a third-party product. In either case, the driver needs to support the specific plotter make and model or, at the least, to support enough of its plotter language to perform proper pen movement and selection.

Plotter Languages

A plotter language consists of a set of command formats that tell the plotter what to do. CalComp's 900-series format used to be the plotter industry's de facto standard. In recent years, however, the situation has changed, particularly at the lower end of the plotting spectrum. In the early 1980s, HP introduced the first of its 7500-series plotters, which at the time were priced right for the expanding micro CAD market. HPGL (Hewlett-Packard Graphics Language) quickly became the dominant language.

All Mac CAD packages that support plotters, and all third-party Mac plotter utilities, support HPGL. You can now buy plotters that support HPGL commands from a host of manufacturers. Even CalComp's latest plotters are HPGL compatible via a facility CalComp calls CPGL, but which follows HPGL conventions.

The second most popular plotter language in Macintosh CAD today is DM/PL from Houston Instrument. "Plotters Compared" lists the languages used by each of the plotters. Note that some can use more than one, offering you additional flexibility.

Quality Counts

"Plotters Compared" also lists three plotter characteristics that affect the quality of your finished drawings: accuracy, resolution, and repeatability.

Accuracy defines how closely a line will be drawn to its intended length. An error margin of 0.01 inch is about as good as pen plotters get these days. Unfortunately, not all plotter vendors make this information known.

Resolution defines the smallest step a pen can be directed to take. High resolution is particularly useful in drawing curves, since curves that contain more small segments look smoother.

Repeatability defines how nearly a pen can be expected to return to its point of departure once it has moved. The figures listed are for the same pen. If you change pens, the probability of its starting exactly at the same location on a drawing is lower. The better plotters (even inexpen-

sive ones) have a repeatability of about 0.004 inch. A higher number usually indicates that your drawing will not look quite as good, since corners may not match.

All of today's plotters are well made, and they are far more reliable than they were years ago. So-called MTBFs (mean time between failures) of 3000 to 4000 hours are common today.

One warning: Buying a high-quality plotter doesn't guarantee you'll get high-quality plots. You must match the media, pen type, ink type, pen speed, and even the amount of force with which the pen is applied to the medium. If you don't, you'll get terrible plots even out of the best plot-



ter. The best way to ensure consistent results is to find a plotter that can use the type of media you require, and then stick to the exact pen type, media type, pen speed, and contact force settings the plotter manufacturer recommends. The companies researched the subject for years and have chosen combinations that their tests have shown to work the best.

When the Fastest Isn't

The most commonly quoted performance figure for plotters is pen speed, usually expressed in inches per second (ips). This is the maximum speed at which a plotter can move its pen across the media. Another common statistic is acceleration rate (see "Plotters Compared"). In the real world, however, the plotter with the fastest

The Artisan 1023 is the latest in a long line of floor-model, drum-type plotters from CalComp. It produces A-through D-size plots in up to eight colors.

Plotters Compared

Manufacturer Model Price	CalComp 1023 \$4895	CalComp 1043GT \$8905	CalComp 1042GT \$9900	CalComp 1044GT \$13,900	Enter SP600 \$995	Enter SP1000 \$3995	Enter SP1800 \$4695	HI PC 695A \$795	HI DMP-40 \$1195
Configuration									
Drum	•	•	•	•	•	•	•	•	•
Flatbed					•			•	•
Tabletop					•			•	•
Floor	•	•	•	•		•	•		
Media size range	A-D	A-F	A-F	A-F	A-B	A-D	A-D	A-B	A-B
Cutsheets	•	•	•	•	•	•	•	•	•
Continuous-roll paper			•	•					
Physical									
Height (in.)	41	47	47	47	3.2	41	41	9.2	4.4
Width (in.)	37	54	54	54	18	39	39	17.5	21.2
Depth (in.)	16	22	22	22	11.5	8	8	7.8	8
Weight (lbs.)	84	150	150	150	8	100	65	6.5	11
Specifications									
Max. pen speed (in./sec.)	30	24	24	24	14	24	31.5	4.2	3
Speed is adjustable	•	•	•	•	•	•	•		
Max. acceleration (g's)	2.8	1.2	1.2	1.2	3	2	2	n/a	n/a
Accuracy (percent of move)	0.10%	0.10%	0.10%	0.10%	n/a	0.20%	0.20%	n/a	0.35%
Resolution (in.)	0.0005	0.0005	0.0005	0.0005	0.001	0.00025	0.00025	0.005	0.001
Repeatability (in., same pen)	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.005
Pens									
Standard number of pens	8	8	8	8	6	1	8	4	1
Max. number of pens									
Self-capping	•	•	•	•	•		•		
Languages									
HPGL	•	•	•	•	•	•	•		
CPGL	•	•	•	•					
DM/PL								•	•
PCI	•	•	•	•					
Other (proprietary)									
Intelligence									
On-board CPU	68000	68008	68008	68008		•	•		
Max. buffer size	2048K	22K	22K	22K	7.5K	18K	16K	256 bytes	1K
Auto. set of pen speed/pressures	•	•	•	•			•		
Max. baud rate	9600	9600	9600	9600	9600	9600	9600	9600	9600
Firmware									
Constant pen velocity	•	•	•	•			•		
Sort plot order by pen	•	•	•	•					
Sort plot order by location	•	•	•	•					
Multiple fonts	•				•	•	•		
Closed area fill									

Plotters Compared

Manufacturer Model Price	Roland DX1880 \$1395	Roland DX1885 \$1695	Roland DX1980 \$1795	Roland DX1990 \$2295	Roland GRX300 \$5295	Roland DPX2000 \$5495	Roland DPX3300 \$7495	Roland GRX400 \$7495	Zericon 3600-D \$2295
Configuration									
Drum					•			•	•
Flatbed	•	•	•	•		•	•		
Tabletop	•	•	•	•		•			
Floor					•	•	•	•	•
Media size range	A-B	A-B	A-B	A-B	A-D	A-C	A-D	A-E	C-D
Cutsheets	•	•	•	•	•	•	•	•	•
Continuous-roll paper									
Physical									
Height (in.)	3.5	4	4.2	4.5	45.4	5.5	33.5	52.8	37
Width (in.)	21	23	21	24	40.2	31	46.5	48.2	30.75
Depth (in.)	17	17	18	18	21.1	23	7	21.1	20
Weight (lbs.)	9.5	n/a	11.2	n/a	110.4	38.9	88.3	132.5	36
Specifications									
Max. pen speed (in./sec.)	7.8	11.8	9	11.8	23.6	15.8	18	23.6	7
Speed is adjustable					•	•	•	•	
Max. acceleration (g's)	n/a	n/a	n/a	n/a	3			3	n/a
Accuracy (percent of move)	0.50%	0.30%	0.50%	0.30%	0.10%	0.30%	0.20%	0.10%	n/a
Resolution (in.)	0.002	0.001	0.002	0.001	0.0006	0.0005	0.0004	0.0006	0.001
Repeatability (in., same pen)	0.012	0.004	0.012	0.004	0.004	0.002	0.004	0.004	0.001
Pens									
Standard number of pens	8	8	8	8	8	8	8	8	1
Max. number of pens									
Self-capping		•		•	•	•	•	•	
Languages									
HPGL	•	•	•	•	•	•	•	•	
CPGL									
DM/PL									•
PCI									
Other (proprietary)	•	•	•	•	•	•	•	•	
Intelligence									
On-board CPU					•	•	•	•	
Max. buffer size	10K	1K	1K	1K	1024K	15K	15K	1024K	2K
Auto. set of pen speed/pressures					•	•	•	•	
Max. baud rate	9600	9600	9600	9600	9600	9600	9600	9600	9600
Firmware									
Constant pen velocity									
Sort plot order by pen					•			•	
Sort plot order by location									
Multiple fonts	•		•	•	•	•	•	•	
Closed area fill									

raw statistics may not be the fastest plotter. What's important is not how fast the pen travels, but *throughput*—how long it takes for a drawing to be completed.

Factors that influence a plotter's throughput include *pen-up* speed (not necessarily the same as *pen-down* speed), *pen-change* speed, and—most important—optimization of the plotting sequence to minimize the number of pen changes and pen movements. To illustrate how all these factors affect a plotter's throughput, we plotted a drawing file obtained from IGC Technology, the creators of PEGASYS CAD for the Mac (see "Throughput Express").

When you inspect the graph "Throughput Time Trials," you'll see that plotter throughput is not directly proportional to maximum pen speed. The victorious HP DraftMaster has a pen speed of only 24 ips, while the third-place DMP-61 has a speed of 32 ips. The lack of linearity in pen speed versus throughput is explained by the DraftMaster's 5.7 g acceleration rate, very fast pen-up speed, fast pen-changing mechanism, and plot-optimization firmware. Similarly, the 30-ips CalComp 1023 provides greater throughput than the 31.5-ips HP 7550A or the 32-ips Houston Instrument DMP-61. This is due primarily to CalComp's plot optimization firmware, which more than makes up for the other plotters' faster pen speeds and pen-changing mechanisms.

So What Is Optimization?

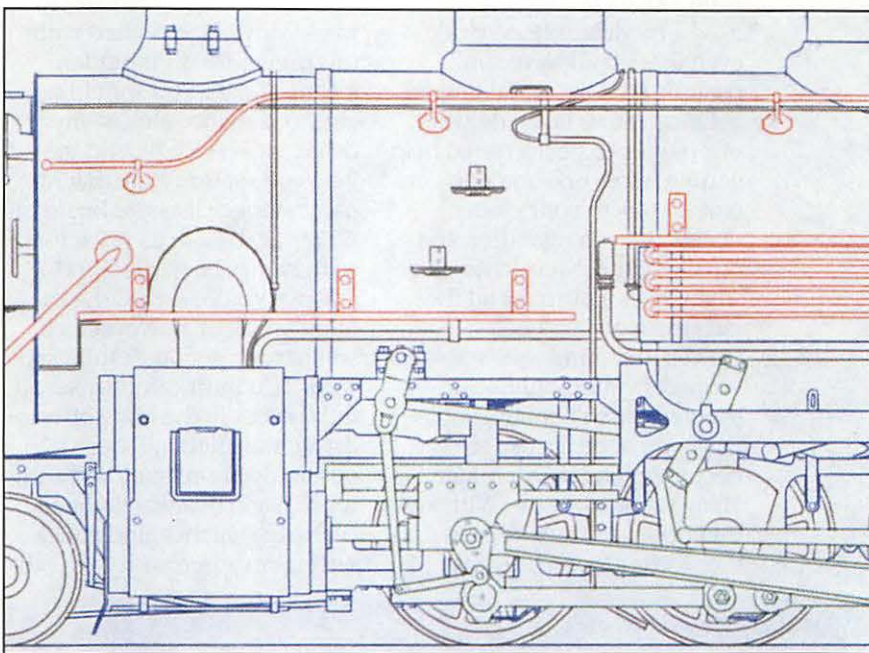
Years ago mathematical algorithms were developed for predicting the best pen velocities for all plotter cornering situations. Like a skilled race car driver, some optimization firmware keeps its vehicle (the pen) moving at the top speed possible through all the abrupt cornering moves needed to plot a drawing. The more sophisticated plotters actually look ahead to see the angle of the path they will take next and adjust themselves accordingly, only slowing down if there is a large change in angle ahead.

Another type of optimization firmware continuously looks at the incoming drawing data with an eye toward minimizing the number of pen changes and keeping a pen active in a given area of the drawing for as long as possible before moving on. Still other types of optimization are concerned with drawing quality—making sure, for example, that the pen always moves at a constant velocity (to keep the line uniform in density) regardless of

whether it is doing an axial (*x* or *y* only) or non-axial (simultaneous *x* and *y*) movement.

Recently it has become both economically and physically feasible to implement all these optimization algorithms directly inside the plotters. We now have full-blown computer systems inside many pen plotters; some, for example, are now equipped with 32-bit CPUs. "Plotters Compared" shows the optimization capabilities, if any, of each plotter listed.

To assess the degree of improvement that optimization can provide, I compared a CalComp 1023 running with its Plot Manager firmware in use and then with it



turned off. On one-pen (monochrome) tests, the reduction in plot time achieved by having the plotter internally sort the plot commands—to draw elements in the most efficient order—came to 20 percent. When the identical plot was made with four pens, optimization reduced the number of pen changes from 89 to 4 and the total plot time by a whopping 36 percent.

The Beauty of Buffering

How long it takes a plotter to plot is critical, since most Mac plotting software ties up the computer when it's plotting. As a serial activity, plotting could become a background task in the future, particularly with MultiFinder. One Mac CAD package, SNAP from Data Basics, already treats plotting as a background task. For the most part, however, we'll have to live with the unavailability of our Macs while we're

Throughput Express

The throughput test drawing contains 202 circles or arcs, 24 double lines, 25 fillets, 616 lines, 50 polygons, 41 rectangles, and 2 blocks of text. This detail comes from a version plotted on a CalComp 1023.

Tying It All Together

Most Mac technology at least approaches the "plug and play" ideal. Pen plotters, however, still have a long way to go on this road. Every plotter I worked with in researching this article presented at least one new hardware challenge. For example, few had the same input connectors (some were male, others female, and one used a modular phone jack), even though all were supposedly RS-232C serial devices.

Once you've taken delivery of a plotter, expect to need help getting it to work. You may have to talk to your plotter dealer, the manufacturer, and the CAD or plotter-driver software developer to get all the information you need.

Even assuming your software supports your plotter, your problems aren't behind you. First, you need a cable to connect the plotter to your Mac. Many variations exist. With few exceptions, you won't even find the words *Macintosh cable* in

your plotter documentation. Your best bet is to buy the plotter and the cable from someone who has experience with Macs. Fortunately, more and more Apple dealers are beginning to carry plotters.

To help you out, the three schematic diagrams presented here show the connections required to get most plotters to work with a Mac. Armed with this previously well-hidden technical data, you should be able to convince almost any dealer or service person to help you set up. (Note that Apple no longer lists the ImageWriter I cables in its price lists, so they may be hard to find.)

Once you've solved the cabling problem, however, you still have to get other things to work. You must carefully set all the choices in the Mac software driver and all the plotter's various hardware-related, software-related, and firmware-related controls, switches, and panel settings to agree with each oth-

er. This includes plotter language, baud rate, number of data and stop bits, type of parity (if any), and type of handshaking.

In some Mac CAD packages, such as VersaCAD, most of these settings are fixed. Other packages give you a choice. Although my needs are atypical, rather than go crazy with over a dozen CAD packages on my Mac and (at the time of this writing) with five different plotters, I used the following settings as a standard: 9600 baud, 8 bits, 1 stop-bit, no parity. By coincidence, these are VersaCAD's nonselectable settings (which are not found anywhere in its manual). So far, the setup is working for me. With just one CAD package and one plotter, all you have to do is find one complement of settings that works (usually by trial and error or by talking with someone who's already been successful).

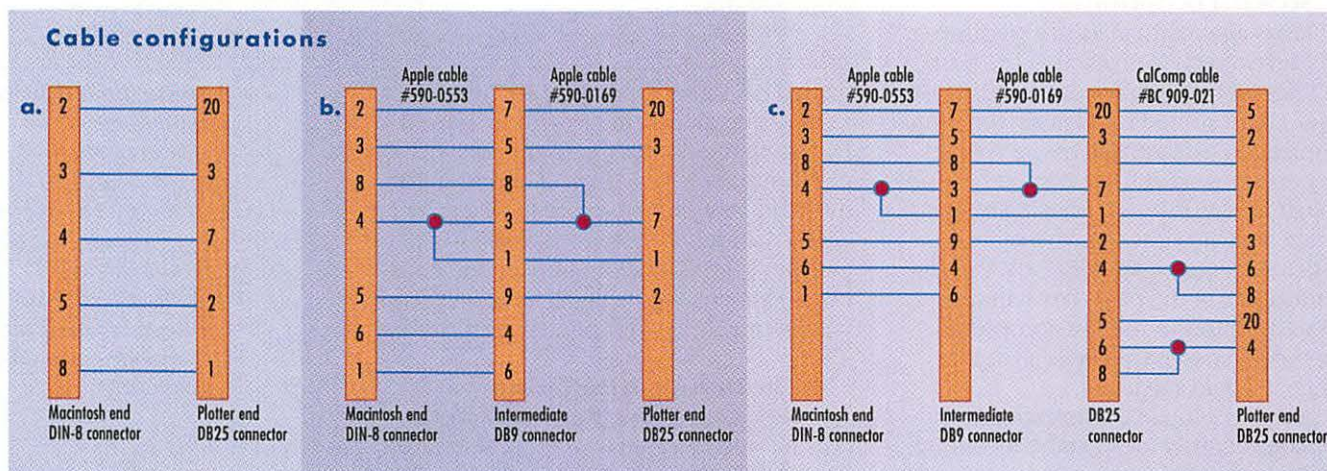
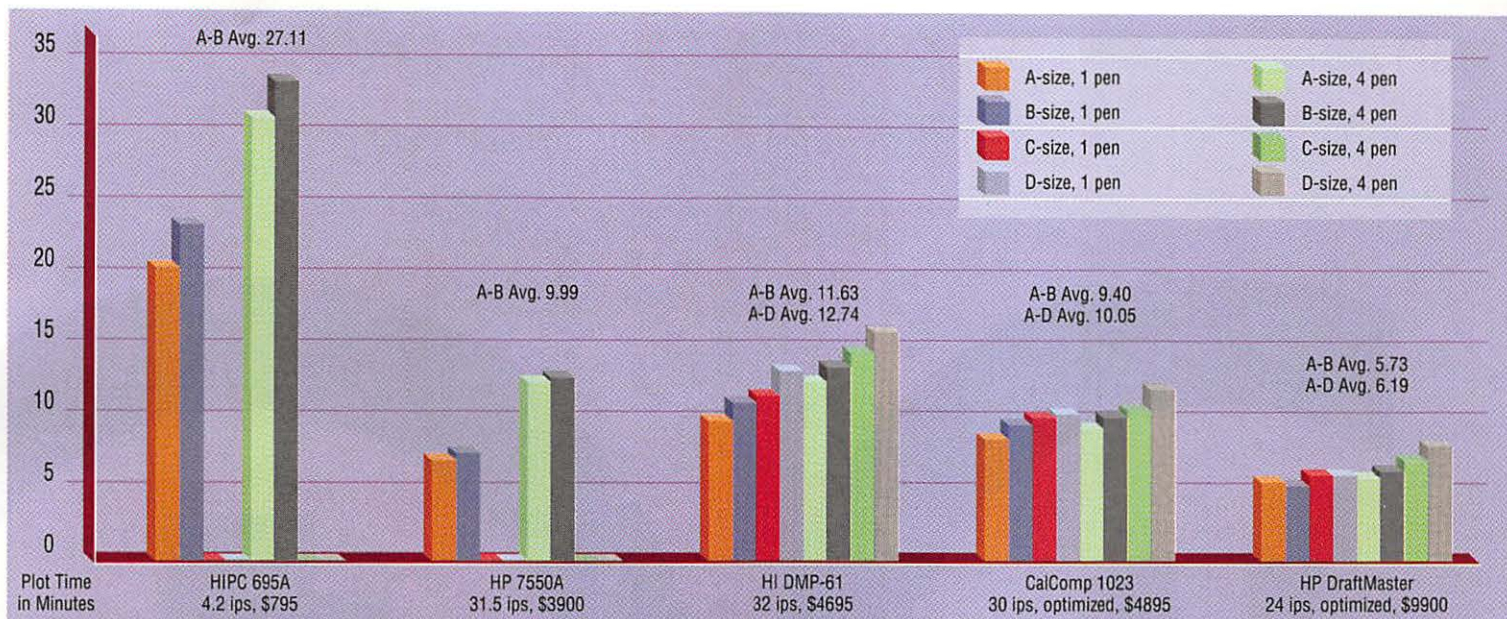


Diagram A is a cable configuration that will hook most plotters to a Mac Plus, SE, or II. Depending on your plotter, the 25-pin connector will be either male or female. Shielded wire is highly recom-

mended. Diagram B shows an alternative that makes use of standard Mac cables; the cable on the left is known as an M019 Macintosh Plus Peripheral Cable; the one on the right is an ImageWriter cable. Dia-

gram C shows how complicated things can get. As you can see, the CalComp 1023 requires yet another adapter, available from CalComp as cable number BC 909-021.



making plots. If you plan to do a lot of plotting, either buy the most sophisticated plotter you can afford, to get the greatest degree of throughput, or consider using one Mac as a dedicated plotter-driving machine.

An alternative is to buy one of the plotters that incorporates a data buffer. For example, the new Houston Instrument DMP-6X-series plotters are expandable to 1 megabyte of RAM, and the CalComp 1023 is expandable to 2MB. Once the data is downloaded, your Mac is free for other tasks. In addition, the data in the buffer can be used for quick "offline" replots. This is handy when you need multiple copies or when something goes wrong during a plot.

Don't Forget Service and Supplies

If you want to avoid trouble after spending a lot of money on your pen plotter, make sure that the supplies for the machine you're interested in are readily available from a local dealer, or at least can be had on short notice from a remote but reputable supplier. Established plotter suppliers like CalComp, Hewlett-Packard, and Houston Instrument have telemarketing organizations that provide overnight delivery of supplies.

In the unlikely event that your plotter breaks down, you'll want local service, or at least the ability to get a fast replacement. You might want to check out Houston Instrument's Priority Response Overnight Service Program which, for a price, guarantees a replacement plotter unit via overnight Federal Express if yours breaks down. Check out what services your potential vendor offers.

Author's Choices

Researching this article, I extensively tested five pen plotters and examined scores of others. Naturally, I began to form opinions about what I like and what I don't like. Of all the A- to B-size tabletop plotters I've examined, the Hewlett-Packard 7550A comes closest to my ideal. It's fast and accurate, rivaling the \$5000 floor models in throughput. It also has controls that are easy to use and is supported by just about every Mac CAD software package. With its automatic paper feed, the 7550A can even do multiple A-size plots unattended. (In addition to plotting CAD drawings, I also use my plotters for printing presentation materials; unattended operation allows me to make a whole series of charts without having to be there to load the paper.)

In the floor-mounted A- to D-size models, as you've probably guessed by now, my choice is the CalComp 1023. It packs a lot of features, performance, and capability into a package that currently has a street price of \$4100 to \$4200. In addition to its sturdy construction, up to 2MB of RAM, effective optimization firmware, and wide choice of languages, I particularly like the way it automatically senses pen type and stores up to four complete sets of user settings. All in all, a complement of useful features you don't find on any of the less-expensive models. I also like the 1023 because it seems far quieter than all the others I've tested. In my small office, that's very important. □

See *Where to Buy* for contact information.

Throughput Time Trials

The plotters tested here represent a range of the plotters that will work with the Mac. I ran all plotters at 9600 baud and at their fastest pen speed, and had PEGASYS scale the output commands to make the drawings fit on A-, B-, C-, and D-size media. Two plots of each drawing size were made with each plotter, one in color and one in monochrome.

World-Class Macintosh



ILLUSTRATIONS BY RUDY VANDERLANS

The vote that counts in the marketplace is the one you cast with your wallet. In the World-Class contest we were after your opinions. Which products deserve a world-class rating based on performance and value? When compared with similar products, which single product stands out as the most coveted and respected? For the second year in a row, we asked *Macworld* readers to vote for their favorite Macintosh products in 42 categories. We chose three winners at random from the thousands of responses we received.

Any contest worth its salt offers a tantalizing grand prize. *Macworld*'s grand-prize winner receives most of the top-voted hardware and software products. The runner-up gets the winning software packages, and the third-place winner receives a selection of winning software programs.

The Prizewinners

The grand-prize winners are Craig and Robin Richart of Glendale, Arizona. The Richarts own an Apple II, which their elementary school-age children use, but they don't own a Mac. On the job Craig uses an IBM PC to do most of his work but seeks out the Mac Plus in his department when he has a report to prepare. Craig's enthusiasm for the Mac led to Robin learning it on weekends at the office. Now she'll have a world-class system when she returns to college this fall to finish her B.A., and Craig will have a chance to put that enthusiasm to work at home learning new products.

The second-prize winner, Craig A. Mattocks, is a research scientist in meteorology at Meso, in Hampton, Virginia. Craig uses mainframes such as the Cray to study and model the atmosphere. The results are downloaded to a Mac SE and animated. Meso recently became an official Apple developer and ordered a Mac II. One of its plans for the Mac II is to compile a HyperCard gallery of famous storms.

Our third-prize winner is Tom Horowitz of Santa Ana, California. As a developer and contractor, Tom runs his business with two Mac Pluses, a Mac SE, an ImageWriter II, a Personal LaserPrinter, a DataFrame 20 hard disk, and two CMS drives. He produces cost breakdowns, project schedules, and invoices with Ragtime, Microsoft Excel, and FileMaker Plus.

The Winning Products

Rather than simply list all of the winning products on the following table, we've selected the products that received a significant percentage of the votes. The Others category represents the combined percentage for product nominations that don't appear on the table; a higher number indicates more contenders in a given category. Since not everyone voted in all the categories, we've noted the percentage of survey respondents in each category. The results of the contest

should not be construed as a *Macworld* endorsement, but they clearly signal readers' preferences.

And what the readers prefer this year is power and versatility. For example, Jasmine's 80-megabyte hard disk won over the 20MB drives, and Jasmine's MegaDrive, a 10MB removable floppy that can be used as a hard disk or for backup, headed the alternative mass storage category. The Mac II was voted Most Promising Newcomer, but if the vote for the Prodigy SE in the Mac upgrade category is any indication of buying trends, it appears that more readers own SEs. While the Hayes Smartmodem 2400 held its place as the winning product overall and the Hayes Smartmodem 9600 made the top 10, the vote for Migent's Pocket Modem confirms that many Mac consumers favor versatility.

With the advent of the Mac II came new hardware categories. Apple won Best Color Monitor and Radius repeated last year's performance, winning Best Black-and-White Display. SuperMac captured the most votes for Best Graphics Board, with Apple's 8-bit expansion kit a close second. Next year the graphics board category will be even more interesting with the increased availability of 24-bit graphic and video cards. Surprisingly, despite the interest in desktop publishing and the presence of several gray-scale scanners, readers voted overwhelmingly for ThunderScan rather than the more sophisticated, more expensive scanners.

Readers had more printers to choose from than last year, but Apple's ImageWriter II and LaserWriter garnered most of the votes. It was too early to tell how Apple's LaserWriter II line will fare against printers from QMS and General Computer, but the high-end NTX seems to have made a strong initial impression.

If any product stole the show, it was HyperCard. Probably this year's most versatile and popular product, HyperCard won first in Programming Language, Personal Management, Education/Training, and Most Promising Newcomer, and took third place in Integrated Products.

Although Apple took the lion's share of votes, the voting was dispersed over more products this year than last. Apple won ten categories (six products), while Microsoft won only three categories compared with last year's nine. The winners in many categories were predictable, but other categories do not yet reflect the impact of products that began shipping in January. We'll have to wait until next year to see what really happens with word processors. How successfully will FullWrite or WordPerfect make inroads upon Microsoft Word's dominating first place on the list?

We'd like to thank our readers for taking the time to respond in this year's World-Class contest. We plan to continue the contest next year, giving you another chance to voice your opinions.

Hardware

Display—B&W



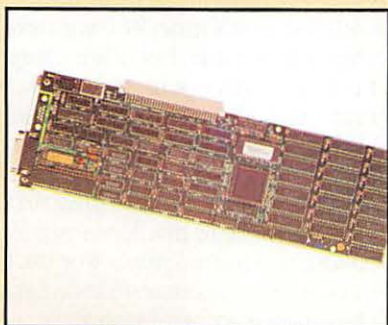
31	Full Page Display, <i>Radius</i>
11	Hi-Res Monochrome Monitor, <i>Apple Computer</i>
9	Two Page Display, <i>Radius</i>
8	The Big Picture, <i>E-Machines</i>
41	Others
100	Total
(17% of respondents voted in this category)	

Display—Color



44	Color Hi-Res RGB Monitor, <i>Apple Computer</i>
21	19-inch Color Trinitron Monitor, <i>SuperMac Technology</i>
9	The Big Picture, <i>E-Machines</i>
26	Others
100	Total
(13% of respondents voted in this category)	

Graphics Board

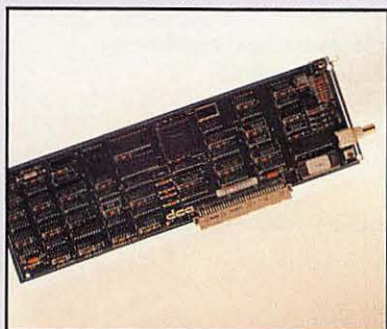


37	SuperMac Spectrum 8, <i>SuperMac Technology</i>
34	Mac II Video Card Expansion Kit, <i>Apple Computer</i>
29	Others
100	Total
(6% of respondents voted in this category)	

Hardware

% of Votes Product, Manufacturer

Communications Board



- 17 **MacIrma, Digital Communication Associates**
 - 17 **EtherTalk Board, Apple Computer**
 - 13 EtherPort SE, *Kinetics*
 - 10 Mac286, *AST Research*
 - 7 AppleTalk PC Card, *Apple Computer*
 - 7 AST-ICP, *AST Research*
 - 29 Others
 - 100 Total
- (3% of respondents voted in this category)

Hard Disk



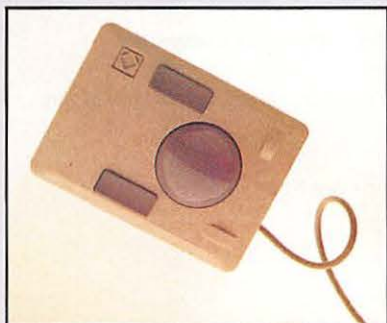
- 14 **DirectDrive 80, Jasmine Technologies**
 - 12 Apple HD20SC, *Apple Computer*
 - 6 DirectDrive 20, *Jasmine Technologies*
 - 4 Apple HD20, *Apple Computer*
 - 4 DirectDrive 500, *Jasmine Technologies*
 - 3 MacBottom HD21, *Personal Computer Peripherals*
 - 3 DataFrame XP-30, *SuperMac Technology*
 - 54 Others
 - 100 Total
- (49% of respondents voted in this category)

Alternative Mass Storage



- 22 **MegaDrive, Jasmine Technologies**
 - 10 Apple 800K External Drive, *Apple Computer*
 - 0 QT-Mac-40, *Tecmar*
 - 68 Others
 - 100 Total
- (13% of respondents voted in this category)

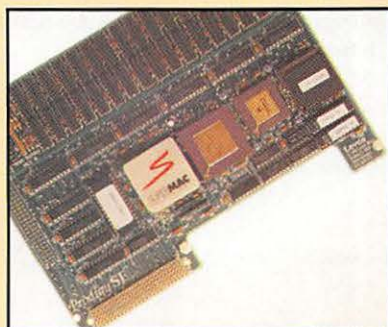
Input Device



- 10 **Turbo Mouse, Kensington**
 - 8 Mouse Trackball-Propoint, *Abaton*
 - 8 Apple Expanded Keyboard, *Apple Computer*
 - 8 Mac-101 Enhanced Keyboard, *Apple Computer*
 - 6 A+ Mouse, *Mouse Systems*
 - 60 Others
 - 100 Total
- (16% of respondents voted in this category)

Hardware

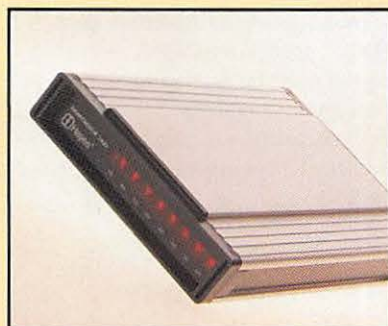
Macintosh CPU Upgrade



% of Votes Product, Manufacturer

24	Prodigy SE, SuperMac Technology
13	Radius Accelerator, <i>Radius</i>
8	Prodigy 4, <i>Levco</i>
5	Orion 25, <i>MacPeak Systems</i>
50	Others
100	Total
(14% of respondents voted in this category)	

Modem



20	Smartmodem 2400, Hayes Microcomputer
13	Apple Personal Modem, <i>Apple Computer</i>
13	Smartmodem 1200, <i>Hayes Microcomputer</i>
8	Migent Pocket Modem, <i>Migent</i>
5	Courier 2400, <i>US Robotics</i>
4	Practical Modem 2400SA, <i>Practical Peripheral</i>
4	Avetex HC1200, <i>Avetex/Datacom</i>
3	Apple 300/1200 Baud Modem, <i>Apple Computer</i>
3	Smartmodem 9600, <i>Hayes Microcomputer</i>
27	Others
100	Total
(26% of respondents voted in this category)	

Digitizer/Scanner



65	ThunderScan, Thunderware
6	MacVision, <i>Koala Technologies</i>
4	AST TurboScan, <i>AST Research</i>
3	Sharp JX-450, <i>Sharp</i>
3	Abaton 300, <i>Abaton</i>
2	Abaton 300/FB, <i>Abaton</i>
17	Others
100	Total
(23% of respondents voted in this category)	

Printer—Dot Matrix



71	ImageWriter II, Apple Computer
12	ImageWriter LQ, <i>Apple Computer</i>
11	ImageWriter/ImageWriter I, <i>Apple Computer</i>
6	Others
100	Total
(23% of respondents voted in this category)	

Hardware

Printer—Laser



61	LaserWriter Plus, Apple Computer
8	LaserWriter IINTX, Apple Computer
7	LaserWriter, Apple Computer
4	Personal LaserPrinter-PLP, General Computer
4	QMS-PS 810, QMS
16	Others
100	Total

(34% of respondents voted in this category)

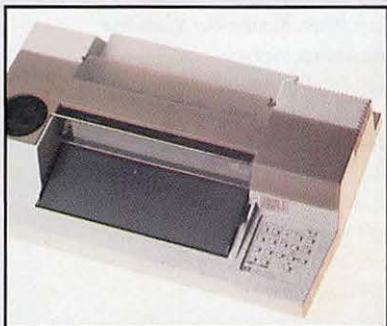
Printer—Color



37	ImageWriter II, Apple Computer
14	Shinko Color Printer, Computer Friends
10	ImageWriter LQ, Apple Computer
7	Tektronix 4693D, Tektronix
5	Panchroma Color Printer, Computer Friends
5	JX-550 4-color thermal printer, Sharp
22	Others
100	Total

(6% of respondents voted in this category)

Plotter



42	HP 7475, Hewlett-Packard
14	HP ColorPro, Hewlett-Packard
12	HP 7550, Hewlett-Packard
7	HP DraftPro, Hewlett-Packard
25	Others
100	Total

(4% of respondents voted in this category)

Most Promising Newcomer



23	Mac II, Apple Computer
7	LaserWriter II, Apple Computer
6	ImageWriter LQ, Apple Computer
6	DaynaFile, Dayna Communications
4	Personal LaserPrinter-PLP, General Computer
54	Others
100	Total

(16% of respondents voted in this category)

Software

Word Processor



% of Votes Product, Manufacturer

67	Microsoft Word, Microsoft
17	WriteNow, <i>T/Maker</i>
8	MacWrite, <i>Claris</i>
8	Others
100	Total
(82% of respondents voted in this category)	

Database Management



20	FileMaker Plus, Nashoba Systems
20	4th Dimension, Acius
11	Reflex Plus, <i>Borland International</i>
9	HyperCard, <i>Apple Computer</i>
7	Double Helix/II, <i>Odesta</i>
6	dBase Mac, <i>Ashton-Tate</i>
5	Microsoft Works, <i>Microsoft</i>
5	Omnis 3/Plus, <i>Blyth Software</i>
5	OverVue/II, <i>ProVue Development</i>
3	Microsoft File, <i>Microsoft</i>
9	Others
100	Total
(48% of respondents voted in this category)	

Spreadsheet

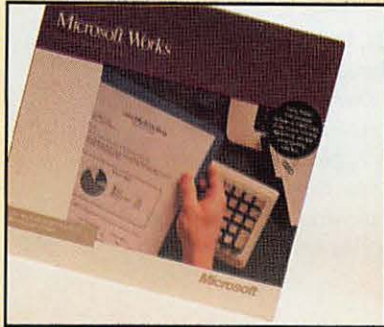


89	Microsoft Excel, Microsoft
3	MacCalc, <i>Bravo Technologies</i>
3	Microsoft Works, <i>Microsoft</i>
5	Others
100	Total
(63% of respondents voted in this category)	

Software

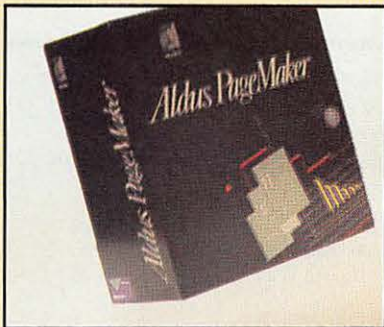
% of Votes Product, Manufacturer

Integrated Products



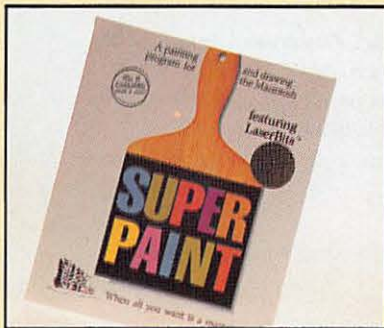
70	Microsoft Works, Microsoft
12	Microsoft Excel, <i>Microsoft</i>
8	HyperCard, <i>Apple Computer</i>
10	Others
100	Total
	(30% of respondents voted in this category)

Desktop Publishing



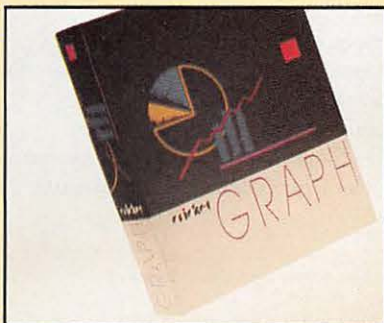
60	PageMaker, Aldus
26	ReadySetGo, <i>Letraset USA</i>
7	XPress, <i>Quark</i>
8	Others
100	Total
	(47% of respondents voted in this category)

Graphics—Paint/Draw/Animation



38	SuperPaint, Silicon Beach Software
11	MacDraw, <i>Claris</i>
10	Adobe Illustrator, <i>Adobe Systems</i>
10	Cricket Draw, <i>Cricket Software</i>
5	VideoWorks, <i>MacroMind</i>
5	MacPaint, <i>Claris</i>
4	FullPaint, <i>Ann Arbor Software/Ashton-Tate</i>
3	PixelPaint, <i>SuperMac Technology</i>
3	Canvas, <i>Deneba Software</i>
11	Others
100	Total
	(57% of respondents voted in this category)

Graphics—Business Presentation

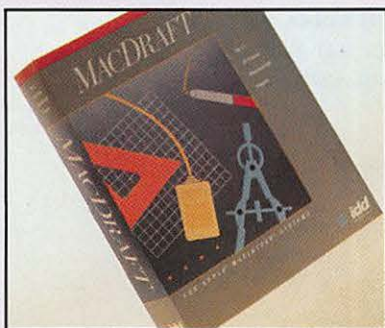


35	Cricket Graph, Cricket Software
21	PowerPoint, <i>Nashoba Systems</i>
9	Microsoft Excel, <i>Microsoft</i>
7	More, <i>Symantec, Living VideoText Division</i>
28	Others
100	Total
	(28% of respondents voted in this category)

Software

% of Votes Product, Manufacturer

Graphics—CAD



23	MacDraft, IDD Innovative Data
15	MGMStation, <i>MicroCAD/CAM</i>
11	MiniCad, <i>Diehl Graphsoft</i>
9	Mac3D, <i>Challenger Software</i>
7	MacDraw, <i>Apple Computer</i>
6	Cricket Draw, <i>Cricket Software</i>
5	Adobe Illustrator, <i>Adobe Systems</i>
5	VersaCAD, <i>VersaCAD</i>
19	Others
100	Total

(14% of respondents voted in this category)

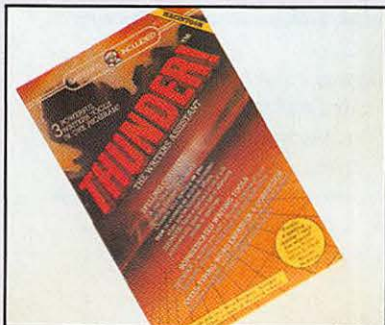
Outline Processing



66	More, Symantec, Living VideoText Division
14	Acta, <i>Symmetry</i>
5	MindWrite, <i>Access Technologies</i>
4	Word, <i>Microsoft</i>
4	ThinkTank/ThinkTank 512, <i>Symantec, Living VideoText Division</i>
7	Others
100	Total

(25% of respondents voted in this category)

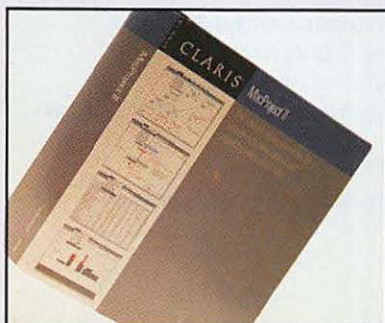
Spelling Checker



22	Thunder!, Electronic Arts
19	Word, <i>Microsoft</i>
15	Spelling Coach Pro, <i>Deneba Software</i>
14	Spellswell, <i>Working Software</i>
8	WorksPlus Spell, <i>Lundeen & Associates</i>
22	Others
100	Total

(24% of respondents voted in this category)

Project Management



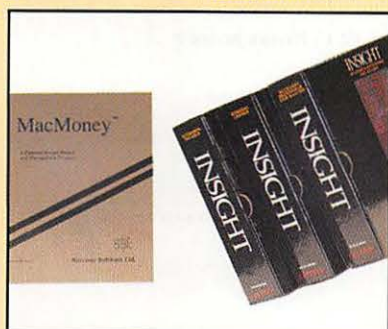
50	MacProject, Claris
14	Micro Planner Plus, <i>Micro Planning International</i>
9	MacProject II, <i>Claris</i>
9	HyperCard, <i>Apple Computer</i>
5	AEC Information Manager, <i>AEC Management System</i>
5	More, <i>Symantec, Living VideoText Division</i>
8	Others
100	Total

(13% of respondents voted in this category)

Software

% of Votes Product, Manufacturer

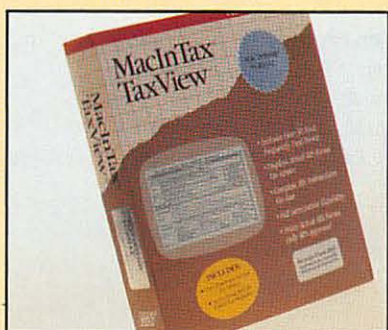
Accounting



18	Insight, Layered
18	MacMoney, Survivor Software
16	Dollars and Sense, <i>Monogram Software</i>
10	Business Sense, <i>Monogram Software</i>
5	Plains and Simple, <i>Great Plains Software</i>
4	In-House Accountant, <i>Migent Software</i>
4	Rags to Riches, <i>Chang Labs</i>
3	Microsoft Excel, <i>Microsoft</i>
2	BPI Entry Series General Accounting, <i>BPI Systems</i>
20	Others
100	Total

(16% of respondents voted in this category)

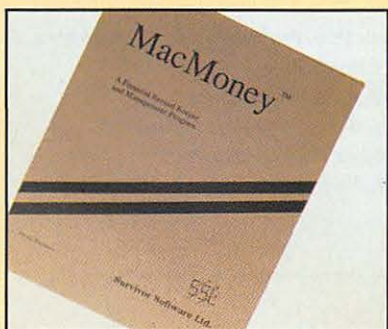
Tax Planning/ Preparation



85	MacInTax, SoftView
4	TaxView Planner, <i>SoftView</i>
3	Microsoft Excel, <i>Microsoft</i>
8	Others
100	Total

(14% of respondents voted in this category)

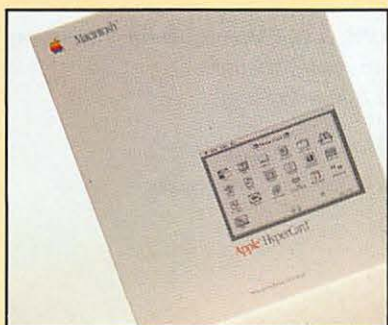
Financial/ Investment



40	MacMoney, Survivor Software
17	Dollars and Sense, <i>Monogram Software</i>
6	Microsoft Excel, <i>Microsoft</i>
6	Market Pro, <i>Pro Plus Software</i>
4	Profit Stalker II, <i>Button Down Software</i>
4	Managing Your Money, <i>MECA</i>
4	MacInTax, <i>SoftView</i>
19	Others
100	Total

(7% of respondents voted in this category)

Personal Management



35	HyperCard, Apple Computer
22	Electric Checkbook, <i>State of the Art</i>
13	Dollars and Sense, <i>Monogram Software</i>
7	Focal Point, <i>Activision, distributed by Mediagenic</i>
23	Others
100	Total

(15% of respondents voted in this category)

Software

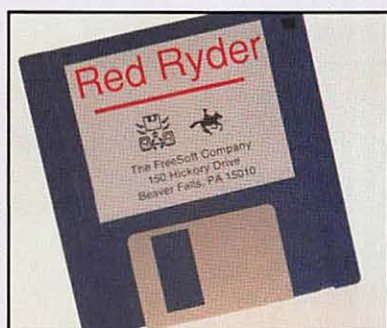
% of Votes Product, Manufacturer

Statistics/Math



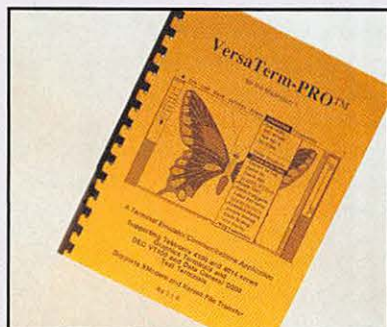
39	Statview 512+, Brainpower
15	SYSTAT, SYSTAT
12	StatWorks, Cricket Software
6	MacSpin, D Square Software
28	Others
100	Total
	(13% of respondents voted in this category)

Communications —General



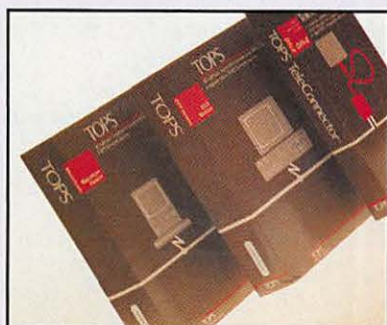
52	Red Ryder, FreeSoft
14	MicroPhone, Software Ventures
8	MacTerminal, Apple Computer
7	SmartCom II, Hayes Microcomputer
5	VersaTerm Pro, Peripherals, Computers, & Supplies
14	Others
100	Total
	(33% of respondents voted in this category)

Micro- to- Mainframe Communications



23	VersaTerm Pro, Peripherals, Computers, & Supplies
21	Red Ryder, FreeSoft
10	MacTerminal, Apple Computer
6	Reflection, Walker Richer & Quinn
6	Mac240, White Pine Software
5	VersaTerm, Peripherals, Computers, & Supplies
29	Others
100	Total
	(11% of respondents voted in this category)

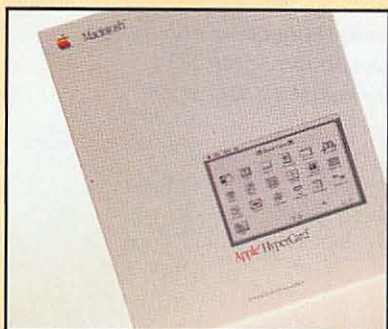
File Server



53	TOPS, TOPS, a Sun Microsystems Company
28	AppleShare, Apple Computer
13	MacServe, Infosphere
6	Others
100	Total
	(11% of respondents voted in this category)

Software

Programming Language



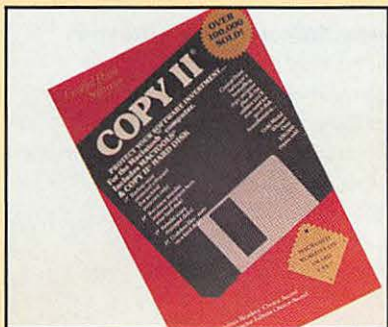
20	HyperTalk, Apple Computer
18	Turbo Pascal, <i>Borland International</i>
15	Lightspeed C, <i>Think Technologies</i>
15	Lightspeed Pascal, <i>Think Technologies</i>
8	MS BASIC, <i>Microsoft</i>
24	Others
100	Total
(33% of respondents voted in this category)	

Utilities—Programming



18	ResEdit/Redit, Apple Computer
15	HyperCard, <i>Apple Computer</i>
14	QuickKeys, <i>CE Software</i>
11	TMON, <i>ICOM Simulations</i>
42	Others
100	Total
(12% of respondents voted in this category)	

Utilities—Disk and File



21	Copy II Mac, Central Point Software
15	DiskFit, <i>SuperMac Technology</i>
11	DiskTop, <i>CE Software</i>
7	Suitcase, <i>Software Supply</i>
6	DiskExpress, <i>ALSoft</i>
40	Others
100	Total
(37% of respondents voted in this category)	

Desk Accessory

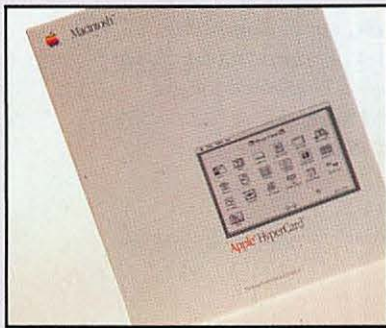


26	Suitcase, Fifth Generation Systems
11	DiskTop, <i>CE Software</i>
7	SmartScrap & The Clipper, <i>Solutions International</i>
10	Calculator+ / SideKick, <i>Borland International</i>
4	Smart Alarms & The Appointment Diary, <i>Imagine Software</i>
42	Others
100	Total
(38% of respondents voted in this category)	

Software

% of Votes Product, Manufacturer

Education/ Training



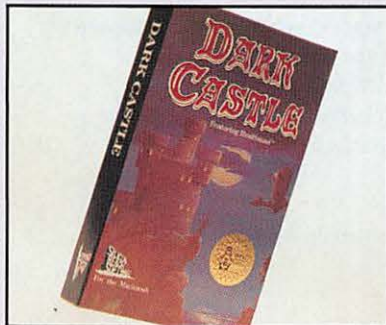
- 31 **HyperCard, Apple Computer**
- 14 Typing Tutor, *Simon & Schuster*
- 9 KidsTime, *Great Wave Software*
- 46 Others
- 100 Total
- (11% of respondents voted in this category)

Music



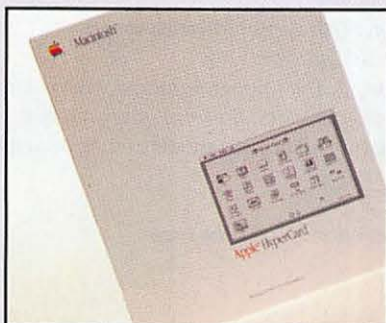
- 19 **Studio Session, Bogas Productions**
- 14 Deluxe Music Construction Set, *Electronic Arts*
- 14 MIDI Recording Studio, *Future Music*
- 9 Jam Session, *Brøderbund*
- 44 Others
- 100 Total
- (13% of respondents voted in this category)

Games



- 35 **Dark Castle, Silicon Beach Software**
- 9 MacGolf, *Practical Computer*
- 8 Falcon, *Spectrum HoloByte*
- 8 Flight Simulator, *Microsoft*
- 3 Shanghai, *Activision, distributed by Mediagenic*
- 3 ShadowGate, *Mindscape*
- 2 Balance of Power, *Mindscape*
- 2 Hardball, *Accolade*
- 2 Chessmaster-2000, *Electronic Arts*
- 28 Others
- 100 Total
- (51% of respondents voted in this category)

Most Promising Newcomer



- 44 **HyperCard, Apple Computer**
- 8 FullWrite, *Ashton-Tate*
- 4 Suitcase, *Software Supply*
- 3 4th Dimension, *Acius*
- 3 FreeHand, *Aldus*
- 3 QuicKeys, *CE Software*
- 2 PixelPaint, *SuperMac Technology*
- 2 WordPerfect, *WordPerfect*
- 31 Others
- 100 Total
- (38% of respondents voted in this category)



***"Can you believe it? Our team got picked
for the hottest project of the year
because they found out
we do all our work on Sony diskettes."***

The fast-moving, fast-thinking people in today's competitive corporate world are the people pushing for the highest standards. For example, Sony diskettes.

People in the know, know that Sony's standards are the very highest. That, after all, is what made Sony a world leader in audio, video and computer magnetic storage media.

But selecting Sony also shows solid business sense because we invented the revolutionary format for the

3.5" drive and 3.5" floppy.

So we simply have much more experience than anyone else at making and perfecting 3.5" floppy disks.



Think of it this way: when your reputation's on the line and you've put your very best into your work, you want to be sure that your floppies are every bit as good as you are.

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Reviews

Very Professional

FullWrite Professional 1.0

Word processor with desktop publishing-oriented layout and graphics features. Pros: Easy-to-follow menu system; multiple-column display; integrated drawing editor; sidebar feature that creates true runarounds. **Cons:** No style or property sheets; slows down noticeably when using the disk as virtual memory in large documents. **Company:** Ashton-Tate. **List price:** \$395. **Requires:** 1MB; external drive or hard disk.



FullWrite Professional is Ashton-Tate's long-awaited high-end word processor, designed for general-purpose word processing with the accents on book-length manuscript preparation and desktop publishing. Its user interface makes producing an occasional memo easy enough, but FullWrite's finest features—posted notes, graphics, and sidebars—come into play when creating longer documents such as newsletters, reports, manuals, and books.

FullWrite's single biggest deficiency is the lack of complete implementation of style sheets (such as those in Microsoft Word and Interleaf Publisher) that are easily transportable from document to document. Since my own word processing needs include some advanced formatting, the lack of style sheets spoils the program. Aside from this omission, FullWrite Professional pretty much satisfies any wish list, coming to a halt just short of being a true page-layout system.

Four Views

And Holy Mackerel, what a feast of features! FullWrite packs so much information on the screen that Ashton-Tate had to divvy the program up into sections to make it easier to grasp.

You can view a document four ways: icon view (showing where posted notes, index entries, footnotes, and the like are embedded), outline view, change-bar view (showing where changes have been made in the text), and WYSIWYG view.

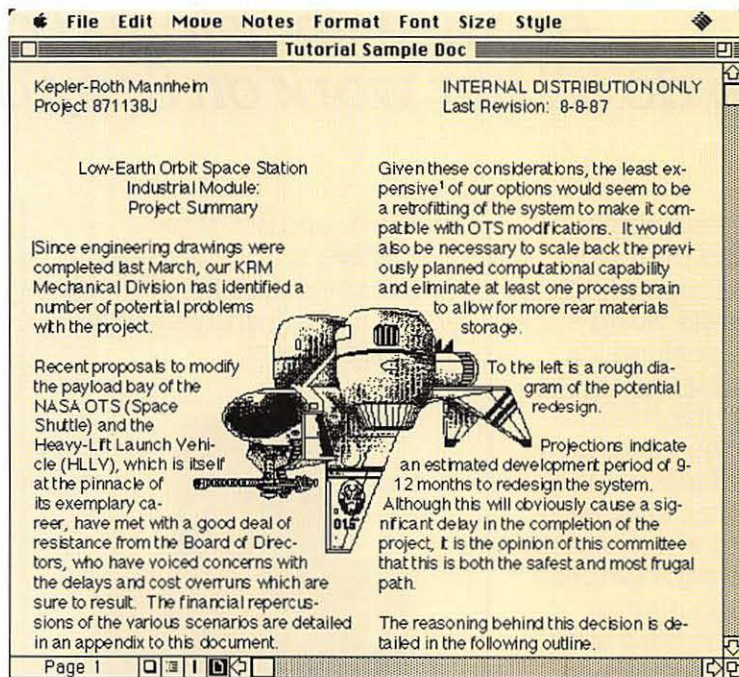
These views are really mode switches—a concept that's antithetical to Mac user-interface purists. But here they work to focus your attention on details rather than getting in your way. If you wish to create a posted note in WYSIWYG view, so be it—you'll see the note's little icon when you switch to icon view.

I found icon and WYSIWYG views

most useful overall. Outlining is best for document planning, and change-bar view—in which black and gray bars denote changes made to a document since it was last saved—is best for group-editing or for legal documents, where changes must stand out.

FullWrite Professional gets top grades for a menu system that simplifies a complex program. Most menu choices bring up a dialog box, some of which also have their own pull-down menu. Apparently, nothing is hidden in this program. When you want to use a feature or change a setup, you'll be able to find it.

There are nits: why is the Doc Setup choice in the File menu rather than in the Edit menu? But this is minor stuff. The new user is more likely to spend time figuring out what to do with this program's features than where to find them.



Runarounds

By using a graphic in a sidebar, FullWrite can flow text around a picture or around a rectangular sidebar containing a picture. Additionally, you can float sidebars along with text or nail them to a specific spot on a page. In one-column style, FullWrite flows text around one side of the graphic only. You control how tightly FullWrite wraps to a sidebar by setting the margin markers on the sidebar's ruler.

Graphics and Sidebars

Two irresistible FullWrite features are integrated graphics and sidebars.

Choosing New Picture from the Notes menu displays a simplified MacDraw-like, object-oriented editor that you can use to create boxes and curves—including Illustrator-like bezier curves—or to paste in bitmapped Scrapbook graphics.

FullWrite automatically places the graphic in your document at the cursor position. You can also use graphics as variables—document-wide glossary entries—for example, as a beginning chapter graphic. Page numbers and mail-merge fields are also variables. Or you could use a graphic as a sidebar; FullWrite will wrap text around one or both sides, conforming closely to any shape you produce—true text runaround.

A sidebar is a separate but related section of text within a document; a FullWrite sidebar can be up to a page in length. The program flows the document's running text around the sidebar. You can anchor a sidebar to a particular page or to a particular position on a page, or float it near a marker embedded in the running text. This makes a sidebar great for illustrations or tables that stay with the referenced text while you're adding to or deleting from it.

Alas, FullWrite, like Microsoft Word, provides no way to sequentially number figures or tables in a document automatically. When your manuscript has 250 illustrations and you add a new one in the middle—or worse, move a figure or text referring to a figure—it's tedious to renumber every illustration and correct all the cross-references. FullWrite otherwise handles graphics and sidebars so nicely, it almost seems as if automatic numbering was overlooked.

FullWrite can create multicolumn layouts on screen with a click of the mouse. It repositions graphics and sidebars automatically. Laying out a standard two-column newsletter is thus a real breeze.



Goodies—and a Caveat or Two

There are more features in FullWrite than a 900-word review can describe. Some of the most useful are not necessarily the flashiest. Autosave is one of the most useful features in the program. Every five minutes (or whatever time length you set), FullWrite saves your file. Currently, WordPerfect is the only other Macintosh word processor with this feature.

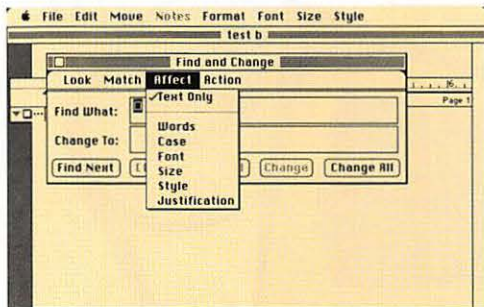
FullWrite can search for and replace words, cases, fonts, styles, sizes, and settings for justification. You can change "Presidential Yacht" to *Presidential Yacht* throughout a document, or find the first instance of an underlined word. Functions for creating tables of contents, bibliogra-

phies, and indexes are also featured. Unlike Word, which uses embedded dot commands to create indexes, FullWrite uses a note-making feature. You enter index information either by typing directly to an index note, or by cutting and pasting from existing text. From my experience with Interleaf, entering index information directly is time-consuming and repetitious; cutting and pasting may be better. But often, index entries in long documents occur right in the running text. FullWrite provides no way to indicate these without cutting and pasting them to an index note.

FullWrite uses the hard disk as a virtual file; the memory of the computer acts as a window onto a portion of a document that can be far longer than would other-

(continues)

wise fit. My Mac II with 5 megabytes ran out of memory at about 50 pages. Creating a new chapter—more as a memory-management technique than a natural document division—tells FullWrite how much document to place in memory at any one time. As files get longer and spill off into virtual memory, FullWrite gets slower. A 90-page, 281K file in two chapters required a second or two for the cursor to jump to a new location 30 or 40 pages distant. So keep chapters short for quickest response time.



Menus with DBs

Most of FullWrite's menu choices display dialog boxes, some of which have pull-down menus of their own. The Find and Change dialog box can search for type styles and sizes based on settings in the main menu, which remains active.

A Final Word

One more caveat: Ashton-Tate supplies a printed warning that FullWrite uses vertical font spacing information that Font/DA Mover version 3.5 or earlier did not necessarily copy. It states that you should use version 3.6 or later to copy your fonts again from original sources. Unfortunately, although Ashton-Tate supplies a system disk with FullWrite, it doesn't supply Font/DA Mover 3.6. I did find an occasional vertical spacing problem that was cured by respecifying the line spacing.

FullWrite stands a good chance of breaking the almost monopolistic hold that Microsoft Word has on Macintosh word processing. It's an original solution that provides more options and information to the writer without cluttering the screen. All told, FullWrite Professional is an outstanding product, but please, Ashton-Tate, unleash the style sheets!—Jeffrey Walden

See *Where to Buy* for contact information.

Background Communicator

MicroPhone II

MultiFinder-compatible communications program. **Pros:** Script execution and file transfers occur in background under MultiFinder; enhanced script language; supports extended keyboards; improved modem support. **Cons:** Numerous user-interface and cosmetic quirks; crashes when printing to LaserWriter IISC. **Company:** Software Ventures. **List price:** \$295. **Requires:** 512KE.



With MicroPhone II, Software Ventures has iced an already-rich cake. The latest MicroPhone builds on its predecessor's strengths, which include a powerful script language for automating communications sessions, strong file-transfer features, and VT100/VT52 terminal emulation (see "Grab That Microphone," *Macworld*, July 1986). And yes, MicroPhone II takes advantage of MultiFinder, so time-consuming operations such as uploading or downloading files can run in the background.

But MicroPhone II doesn't have a monopoly on MultiFinder. Its two chief rivals—Hayes' SmartCom II and FreeSoft's Red Ryder—also support background operations. Whether you choose MicroPhone II or one of its competitors depends on your needs—and on how tolerant you are of MicroPhone II's deficiencies.

Following the Script

MicroPhone's premier edition boasted a powerful script language for creating automatic sequences—series of commands

that perform repetitive actions, such as dialing an information service, then transmitting your user name and password. MicroPhone II's script language executes scripts created with its predecessor and offers an expanded vocabulary for more communications control.

The new version's language includes support for string and integer variables (named storage slots in memory to which you can assign text or numbers). For example, the script in "Communications Script" uses a variable named NumTries to track how many attempts the script makes to connect with an online service. This sample script also showcases the language's new expression analyzer, which allows a script to perform calculations, assign values to variables, and manipulate text strings. These improvements open doors to powerful scripts that filter out prompts, menus, and other effluvia from incoming online text, leaving only the information you want.

The script language boasts other refinements, including statements for controlling cursor position and changing communications settings. A Trace command executes a script one line at a time for debugging purposes. However, unlike Red Ryder 10.3, MicroPhone displays only the number of the statement currently being executed, not the statement itself.

You can also import and export scripts as text-only files, allowing you to reuse scripts. And the wonderful Watch Me command, which translates your online actions into scripts, remains.

Reach Out and Transfer

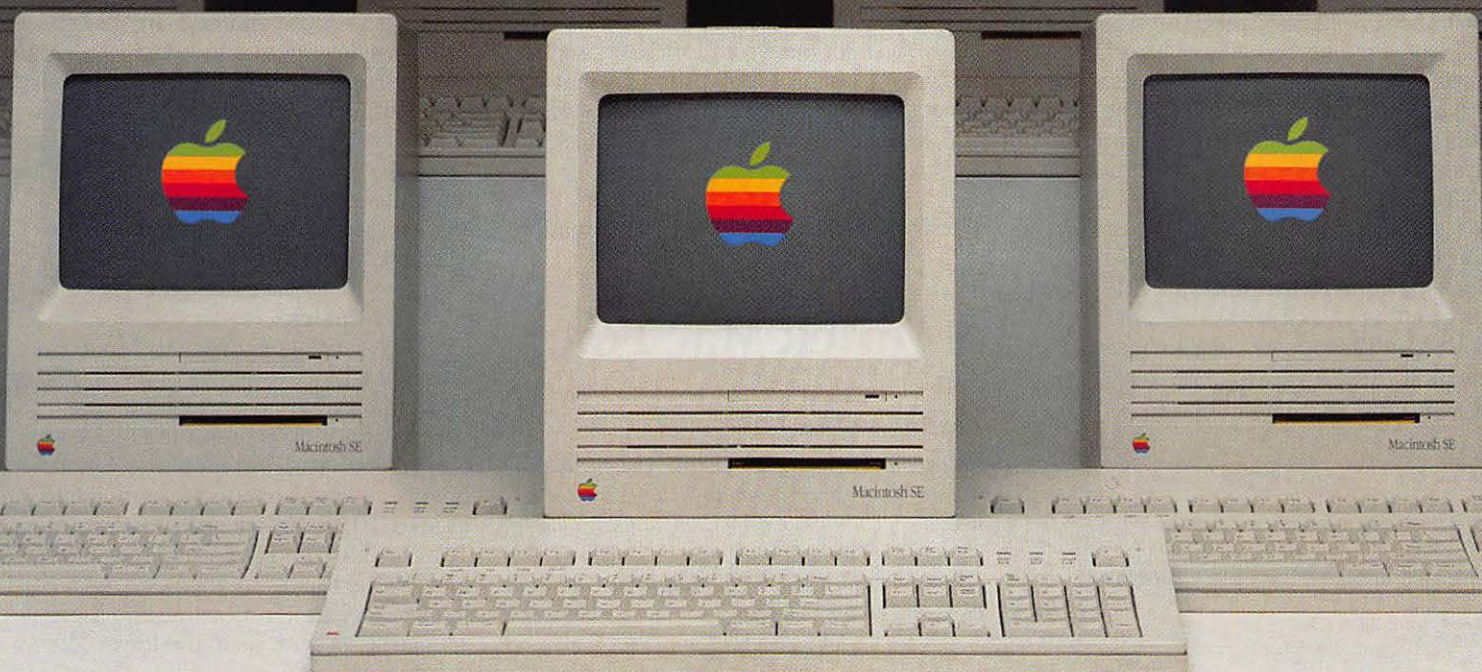
MicroPhone II also introduces a first among general-purpose Mac communications programs: *modem drivers* for Hayes-compatible modems and the Telebit Trailblazer. These are special scripts that teach MicroPhone the commands a particular modem uses to dial, hang up, and handle the other details of placing a call. If your modem uses the industry-standard Hayes AT command set and a single-line phone connection, the modem drivers will mean little. But they're a boon if your Mac is connected to a digital PBX system or to one of the new warp-speed modems—or to modems that are "Hayes almost-compatible."

SmartCom II works with Hayes-compatible modems only; Red Ryder 10.3

(continues)



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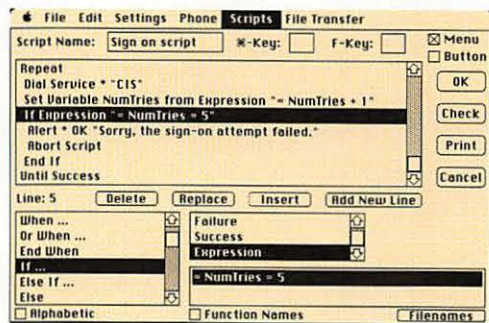
lets you specify modem command sequences but doesn't separate those sequences into discrete files. Thus MicroPhone II is more versatile when it comes to working with different types of modems.

In the file-transfer department, MicroPhone II adds the Kermit and Ymodem-G protocols to its binary-transfer options, which include the Xmodem and Ymodem protocols. The MacBinary option, which transfers such Mac-specific file information as file type, creator, and icon appearance, is available with all four protocols.

MicroPhone's Flaws

MicroPhone II isn't without faults. Unlike SmartCom II's and Red Ryder 10.3's window, MicroPhone's window can't be dragged or resized during a file transfer. That makes it difficult—often impossible—to work with another program or locate a given icon on the desktop. Also, I wish the script editor used pop-up and hierarchical menus so you wouldn't have to scroll through a maze of list boxes. (Seasoned script writers can bypass the script editor entirely by using a text editor to type scripts and then importing them into MicroPhone.)

Other flaws are more serious. I encountered occasional System crashes, especially when returning to MicroPhone after opening and closing other applications under MultiFinder. And the program crashed when trying to print to a LaserWriter IISC that was off-line.



Communications Script

This MicroPhone II script uses a variable named *NumTries* to track how many attempts the script makes to connect to an online service. If the value of *NumTries* reaches 5, MicroPhone II displays a custom dialog box notifying you that the sign-on attempt failed. Place a script's name in a menu or assign it to an on-screen button, ⌘-key sequence, or extended keyboard function key.

Should You or Shouldn't You?

MicroPhone's script language is more powerful than SmartCom's, and its modem drivers make it far more flexible where hardware is concerned. Also, SmartCom II lacks a Watch Me command equivalent, and it doesn't support Kermit transfers. But its design makes SmartCom more approachable for the telecommunications newcomer, and its draggable windows are more suited to MultiFinder use.

Red Ryder 10.3's script language compares favorably with MicroPhone's, although you must type your scripts using a text editor. Unlike MicroPhone, however, Red Ryder lets you manipulate windows while it's running in the background. Even when you aren't using MultiFinder, Red Ryder 10.3 lets you use desk accessories during file transfers. If you're looking for a powerhouse communicator, don't buy until you've compared MicroPhone II and Red Ryder.

Don't get me wrong: MicroPhone II is a very good program. But to make it a great one, Software Ventures must sweat the details and improve the aesthetics.

—Jim Heid

See *Where to Buy* for contact information.

A Quick Mac Fox

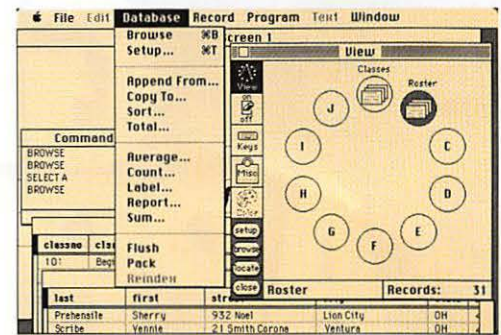
FoxBase+Mac 1.0

Relational database. **Pros:** Fast, flexible database with programming facilities; runs PC dBase applications. **Cons:** Compatibility with dBase forces some compromises. **Company:** Fox Software. **List price:** \$395. **Requires:** Mac Plus; hard disk recommended.



There is considerable incentive to make dBase in-house applications accessible to Mac users. McMax and dBase Mac, for example, attempt to do this in quite different styles. But since the real dBase is a text-based program driven by a somewhat terse command language, making a dBase-compatible program seem like a real Macintosh product requires great ingenuity in dealing with programming compromises.

FoxBase+Mac manages to open a window to the PC world and still provide a viable Mac database. Compromises, where they occur, are minimally inconvenient, and the product outperforms more familiar Mac database programs (Omnis 3 Plus,



Looking In on the Fox

The View window, using a somewhat odd, clock-like tableau for displaying open data files and their links, is the starting point for most FoxBase work. The Database and Record menus alone offer enough functions to cover typical operations other than new database design.

Double Helix II, 4th Dimension) on most raw speed benchmarks. Fox Software has become a major contender in MS-DOS and UNIX environments, and FoxBase+Mac deserves serious consideration as both a stand-alone database product and a connectivity solution. Version 1.0 is the first release in a product line slated to include a multiuser networked version (linking PCs and Macs) and a run-time module later this year.

Fox Basics

The central feature of the FoxBase screen is the View window (see "Looking In on the Fox"). As database files are opened, they are represented in a set of ten circles. If the data files are relationally linked, an arrow connects them; if they are indexed, they display little hand-pointers. The Database and Record menus offer most of the functions you need for record management and reporting, and there is a special set of buttons in the lower-left corner of the View window for the most common operations (Setup, Browse, Locate, and Close). Clicking Browse when one of the data files is grayed out opens a table view of that file for simple inspection, addition, and deletion of records. Corresponding to the dBase format, there are separate file types for data, programs, indexes, and reports.

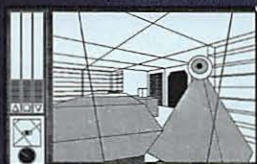
Besides standard text-based fields, FoxBase supports picture fields; long, pop-up memo fields; and complex computed fields. Data input/output can be enhanced with a special Say/Get command set that allows creation of custom entry and display

(continues)

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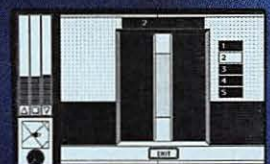


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screens (featuring the usual array of radio buttons, check boxes, and other familiar Mac props), with fields positioned aesthetically on the screen. Another set of commands creates menus within a database application. As do most newer applications, FoxBase supports full control over color display. But data input/output and menu programming is a chore compared to the same task in a Mac-only database like Double Helix II. FoxBase really needs a screen generator—Fox knows this and promises one in the next release. (For this review I looked at a beta version with a full palette of forms-generation tools.) Fox also promises an improved reporting facility—the current version is primitive and PC-like.

As you create, modify, and manipulate a database, all your instructions are recorded in a Command window, which translates your menu commands into dBase command language. Alternatively, you can clear this window, program commands directly, and choose Do from the Program menu. For instance, if you drag a pointer from one data file to another in the View window, you create a relation (to be defined in a dialog box) between the files. You can also type **SET RELATION TO [expression in terms of fields in first database] INTO [second database]**. The Command window records the sequence of your actions using dBase programming

instructions; this creates a bridge from the Macintosh version of FoxBase to the PC version—the file in the Command window can be edited and compared to a PC command sequence.

The PC Connection

As one might expect, FoxBase+/Mac excels at porting over programs from the wrong side of the rainbow. I took a suite of 30 sample databases and program files over from the PC with no glitches, and the developers I surveyed expressed high praise for the PC-to-Mac portability of FoxBase/dBase programs. The developers, in general, are taking accounting and other large database packages over from PC code and adding Mac features (graphics and menus) to generate programs with an acceptable Mac interface.

Porting doesn't work the other way (Mac to PC), except for relentlessly austere programs that avoid all Mac-specific features. It would be possible to write a simple PC application in FoxBase+/Mac, but if your time and sanity are worth anything you would prefer to code PC work on a PC. In an office setting, however, the smooth and wide one-way street for driving PC data

and program files into the Macintosh is one of FoxBase's attractions. (The program, however, does not support import/export facilities to non-dBase files such as WKS and SYLK.)

Fast Fox

FoxBase is one of the largest current Mac applications (544K), but it manages to get out of its own way. On an SE, FoxBase can sort a 5000-record database (six fields, 80 characters total) on a given field in 46 seconds. Comparable numbers are 1 minute, 20 seconds for Omnis 3 Plus (version 3.24) and nearly 15 minutes for 4th Dimension. Note, too, that sorting and indexing tend to be I/O-bound operations—in this case limited by Apple's less-than-awesome 20-megabyte hard disk performance. FoxBase, however, puts as much data as possible into memory, so with an extra 1MB of RAM the program can sort a 1MB file in 8 seconds or less.

Appending 5000 records to this sample database takes 38 seconds, compared to 19 minutes for Omnis and over 3 hours for 4th Dimension. The only popular Mac relational database competitive with this blazing speed is McMax, a more limited product (FoxBase is still faster). Other numbers for prospective users concern capacities. FoxBase can handle up to a billion records (that is, it's limited by disk space) per file, with 128 fields per record and 254 characters per field.

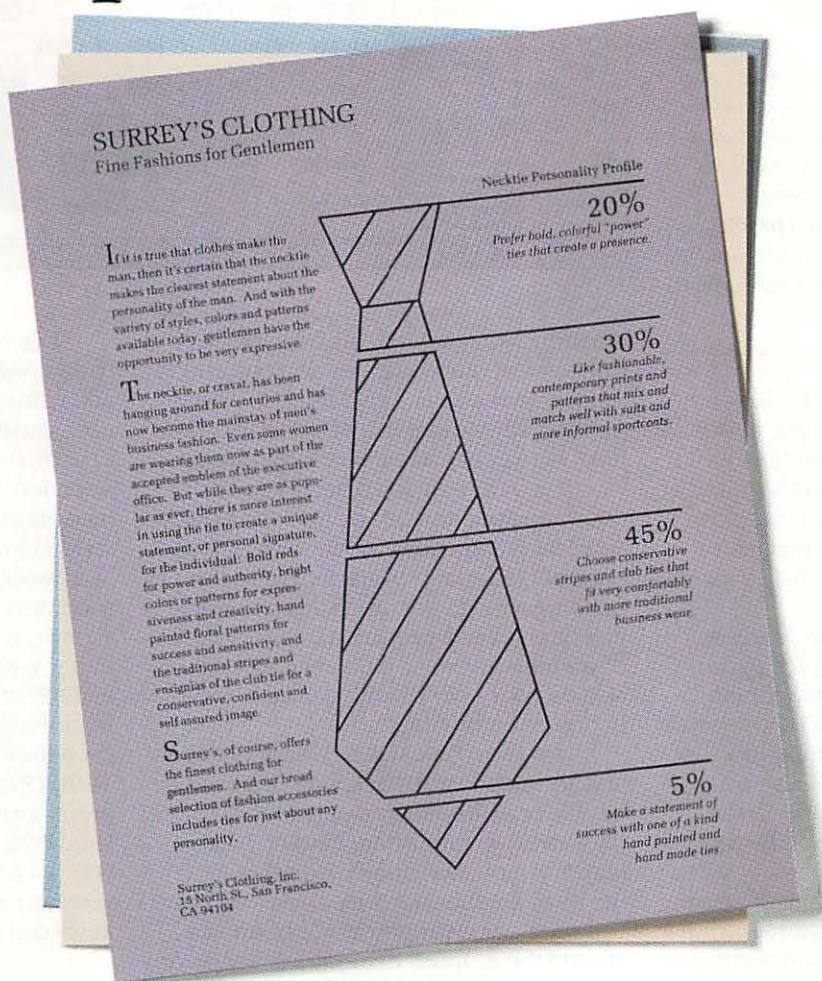
A True Competitor

Two features make FoxBase serious competition for high-end packages such as Omnis, 4th Dimension, and Helix. First, dBase's command language is the best-documented programming language on earth—whereas only a handful of books are available on programming in Omnis or Helix, dBase is supported by hundreds of books, videotapes, and learning aids. Second, FoxBase offers many more features than dBase-compatible McMax and maintains impressive speed advantages over other powerful relational databases.

FoxBase+/Mac thus gets high marks in performance and dBase compatibility, and already provides facilities—albeit sometimes awkwardly—for generating real Mac applications. If Fox does a comparably solid job on the next round of extensions, this program will be a very tough competitor for the older generation of Mac databases. —Charles Seiter

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PageMaker: Staying Ahead

PageMaker 3.0

Page-layout software. **Pros:** Effective automatic text-flow feature; well-implemented style sheets; easy method for running text around irregular graphics; sophisticated spot-color capability. **Cons:** Imprecise typographic control for a state-of-the-art DTP program; no search-and-replace feature; no spelling checker; still lacks important features for lengthy documents.

Company: Aldus Corporation. **List price:** \$595. (Upgrade: \$15 if version 2.0 purchased after November 2, 1987; \$90 if purchased earlier.)

Requires: 1MB, hard disk.



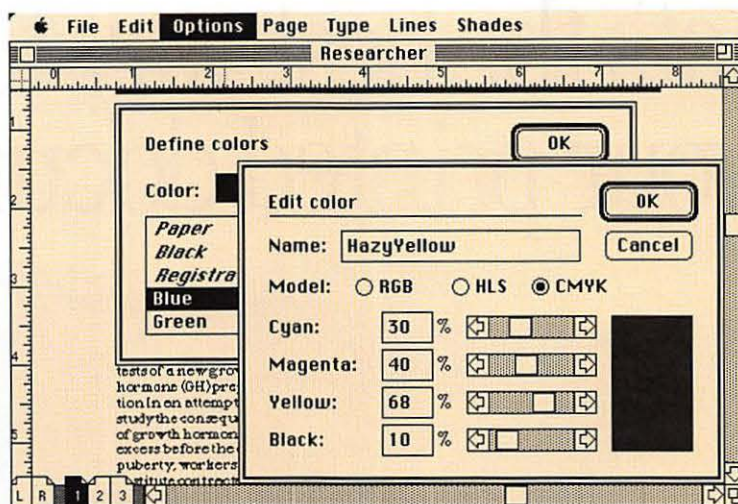
In PageMaker 3.0, Aldus has managed to shore up the most conspicuous weaknesses of the league-leading Macintosh desktop publishing package's earlier releases, while preserving all the familiar and convenient user-interface characteristics that so many people like.

To a large degree, version 3.0 represents a catch-up product: with the exception of an advanced system for defining and applying spot color, there is little here not already offered by the competition. In fact, some significant deficiencies persist from previous versions. Still, PageMaker 3.0 is a solid product and one of the top desktop publishing contenders.

PageMaker was always a big program, but suddenly it's gigantic—now requiring a full 3.3 megabytes of hard disk space if you install the entire package, including the help files and utilities. In the process of bulking up, PageMaker has lost the ability to run on a floppy disk system, but that should improve its performance reputation—it has been unbearably slow when running from floppies. PageMaker 3.0 moves along at an acceptable pace on a hard disk.

A Way with Words

With a new autoflow text-placement feature, this release makes PageMaker easier to use with long documents. The program can now flow text automatically through consecutive columns on existing pages and can create new pages based on a user-created master as needed until an entire text file of almost any length has been placed. There's also a new semiautomatic text-flow mode that speeds the process of



PageMaker Color Menu

The Edit Color dialog box shows one of PageMaker 3.0's three color-mixing models. On a color monitor, the box at the right shows the color you're creating as you change the percentages of component hues and other color characteristics.

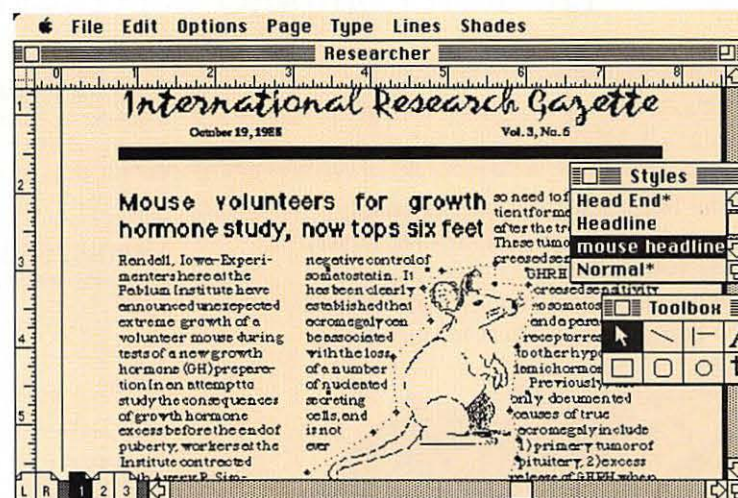
breaking a text file into odd-size blocks. Unlike most other Mac desktop publishing programs, however, PageMaker still offers no easy way to establish or break text-flow links between discrete blocks randomly.

If you do want to create books or other long documents, be forewarned that PageMaker falls short in other ways. The program lacks any special amenities for building a mega-document from multiple files, and it won't prepare indexes or tables of contents, even for individual files. You're also on your own when it comes to footnoting or endnoting.

However, PageMaker 3.0 can now flow text around irregular graphics, a talent that has become absolutely de rigueur in today's desktop publishing market. PageMaker's implementation of this feature is the most flexible and the easiest to use that I've seen—you simply draw a boundary around the graphic, defining any shape you like (see "Automatic Text Flow").

PageMaker 3.0 now offers style sheets, truly a page-makeup must. You can define and name any number of reusable styles, each consisting of a comprehensive array of textual characteristics (type style, font selection, tab settings, and so forth) that take effect en masse when you apply the style to a paragraph. Bolstering its strength as a layout engine for text created in other programs, PageMaker recognizes style assignments you make in a word processor, either with that program's own style sheet feature, or by typing in style names at the beginning of any paragraph. PageMaker even imports style definitions from Word. Within PageMaker, you can change paragraph formats simply by selecting the desired style from a scrolling window that you can leave on the screen (unfortunately, you can't assign frequently used styles to keyboard shortcuts).

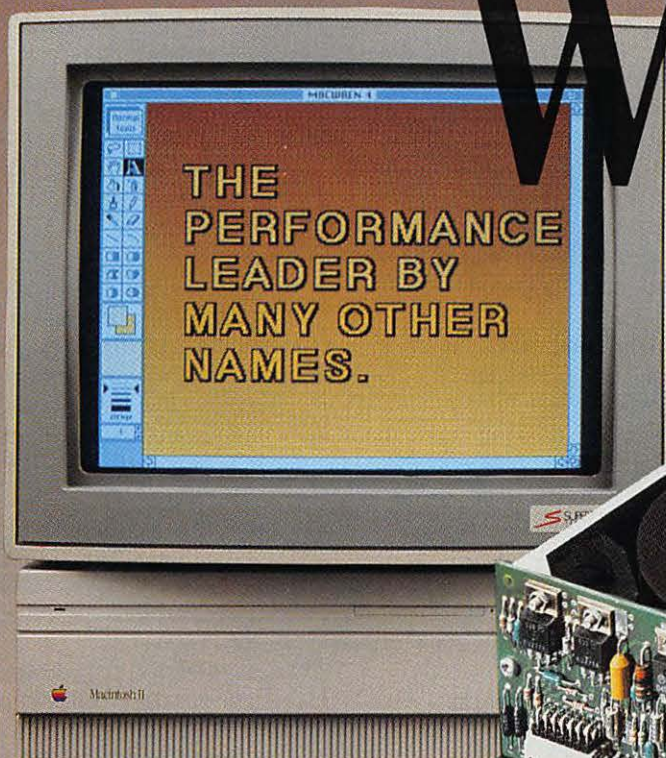
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Automatic Text Flow

The dotted line surrounding the mouse's picture is a boundary for automatic text flow. It was defined by creating the larger dots, which serve as handles for the boundary, and then moving them freehand to the desired location. The style sheet window enables you to apply predetermined styles to paragraphs.

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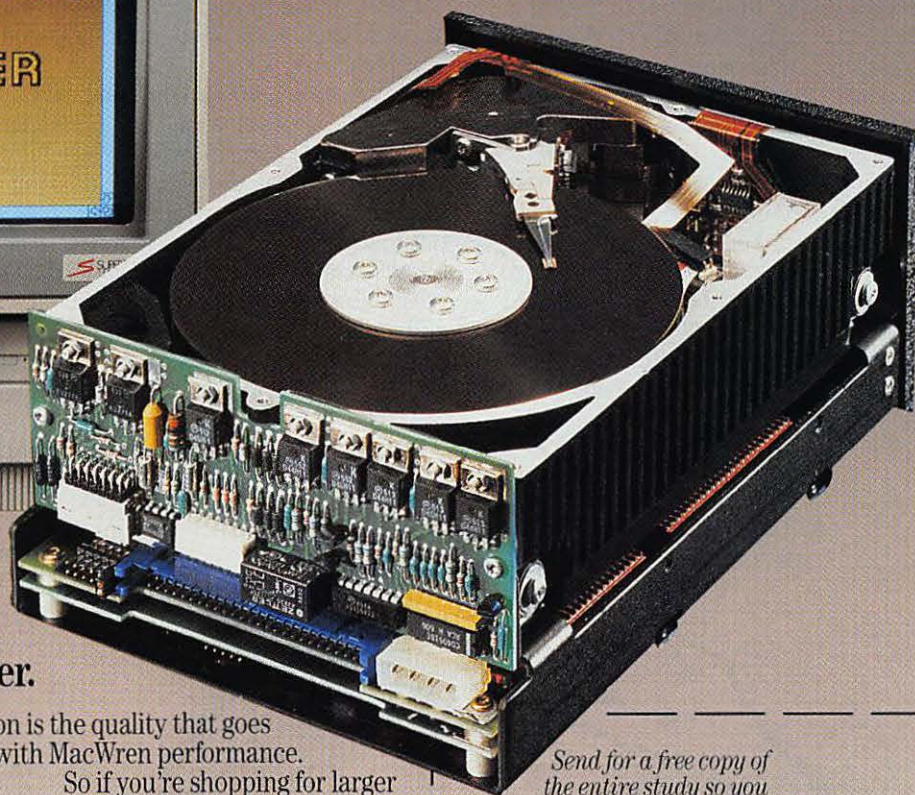
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Carrying the style sheet idea a step further, PageMaker now lets you create templates, convenient reusable documents that include predefined master pages and style sheets. Twenty effective templates covering many common applications—brochures, newsletters, and the like—come with the program.

These major enhancements correct the most glaring text-related weaknesses of its predecessors, but PageMaker 3.0 still scripps on details that many people will consider important. If your documents run to more than a page or two, you'll quickly come to rue the omission of a search-and-replace capability. The lack of a spelling checker is less critical, but nonetheless a nuisance. And the program's typographic controls are still imprecise, compared to competitors like XPress. In PageMaker, for example, the smallest leading increment is half a point; kerning increments are relative to font size, and can't be specified numerically. You're restricted to whole-number font sizes between 4 and 127 points.

Color Collage

On the graphics side, PageMaker 3.0 sports two major new features: a versatile spot-color capability, and an Image Control dialog box for altering the shading, contrast, and other characteristics of imported

graphics. You can apply a single color to any object (text or graphics element) in a document from a scrolling window of color choices, just as you would a text style. You can alter these colors or create new color definitions from scratch, using one of four common color models, including the cyan, magenta, yellow, black (CMYK) model used in commercial process color printing, and the Apple color wheel.

The options in the Image Control dialog provide much-needed control over the appearance of bitmapped graphics. Not only can you handle mundane graphics chores—like lightening an overly dense picture or matching the resolution of a scanned image to your printer—you can also add great special effects to scanned graphics.

PageMaker 3.0 remains an elegant, enjoyable piece of software, and its new text and graphics talents position it as a hot contender among the best Mac desktop publishing programs. Competing products outdo PageMaker in some feature areas, but version 3.0's enhancements, and its reasonable upgrade price, will probably end the temptation of already satisfied PageMaker users to look elsewhere.

—Steve Cummings

See *Where to Buy* for contact information.

What, No Icons?

MPW Shell 2.0.2

Professional software development system.

Pros: The most sophisticated and complete development package available for the Macintosh.

Cons: Traditional programming environment requires that you remember many commands.

Documentation is intelligible only to experienced programmers. **Company:** Apple Programmer's and Developer's Association (APDA). **List**

price: MPW 2.0 (Shell) \$200, MPW C \$125, MPW Pascal \$125. Available only through APDA.

Requires: 1MB, hard disk.



Imagine the Macintosh without icons. Without dialog boxes. Without the friendly interface we know and love. Imagine a Macintosh with command lines and parameter lists like "link -w -t APPL -c '???' Lobo.c.o {CLIBRARIES} Interface.o. . . ." A nightmare? No, it's the Macintosh Programmer's Workshop (MPW), a comprehensive and powerful programming environment for the Macintosh, created and used by the programmers at Apple.

MPW is a collection of programming tools that run under the Shell, an environment that bears an uncanny resemblance to UNIX. The Shell provides UNIX-like features such as pipes, by which the output of one program is directly passed to the next program. The many programming tools include an assembler, a linker, a resource editor, a resource compiler and decompiler, debugging tools, performance measurement tools, and a host of other aids.

Now What?

Running MPW for the first time is intimidating. You face an empty window, a somewhat familiar menu bar with File, Edit, and Find menus, and that nagging question: "Now what?" Unfortunately, the MPW manuals don't provide much of a tutorial on using the system. All two pounds of documentation are written in nearly straight programmer-ese, which is fine once you get used to the system. But plan to spend a few hours getting acquainted with it before you try writing any programs.

When you've passed the initial barriers, MPW provides some useful help facilities. For instance, Commando helps you

(continues)



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master the often cumbersome MPW commands. When you invoke Commando with the name of a command, MPW presents an elaborate dialog box that helps you prepare all the parameters expected by that command (see "Commando"). And the Build menu helps you build script files that automatically compile and link your programs.

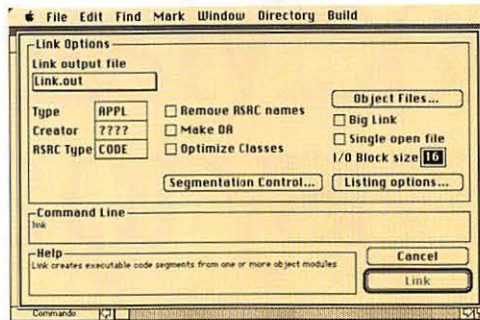
Scripts, Anyone?

There are more than one hundred commands in the Shell command language to handle everything from program development to file management to disk navigation. In fact, you might think of the Shell as a command-oriented version of the Finder. But while you are limited in what you can do from the Finder, you can program the Shell using the command language and also by creating script files.

A script file is simply a program for the Shell written in the Shell command language. You can, for example, build a script that compiles, links, and tests a program that you are developing. Or you can build one that creates a new menu, cleans up your disk, and performs a half dozen other functions. "Writing a Script" shows an example of a script file that MPW uses to create and display one of its own menus.

I Want to Be a Programmer

Of course, the reason that MPW exists is so that you can write programs. To this end, it supports numerous program development tools. With MPW, you can write a program, compile or assemble it, link it with a vast array of libraries, watch it as it runs with a debugger, peer at its disassembled innards, and find out where it spends most of its time. You can build stand-alone applications and desk accessories, or your own personal MPW tools. You can create resources such as menus, dialog



Commando

In order to help you master MPW's command language, the program includes Commando—a facility that aids you in preparing the parameters expected by a command. The dialog box is elaborate and assumes at least a basic knowledge of programming.

boxes, and icons using the resource editor and compiler, and combine them with your program. In short, you can do everything you need to do in order to create a Macintosh program.

The MPW program editor is indistinguishable from the main MPW Worksheet window. In fact, when you're writing a program, you haven't left MPW at all. If you want to, you can execute MPW commands from a window in which you're editing a program. Of course, if you leave those commands in the file when you compile it, the compiler will treat them as errors.

The MPW editor appears to be a simple Macintosh program editor. You can do the usual things, like Copy, Cut, Paste, Find, and set tabs. Since it's not a word processing program like MacWrite, you can select only a single font for the entire window. Most of the common functions are provided in Edit and Find menus, but you can also enter editing commands from the

keyboard. For example, the command *Undo Lobo.c* undoes the last editing function that was done in the window Lobo.c.

MPW includes a powerful macro assembler that can generate code for the M68000, 68020, 68851, and 68881 processors. You can also purchase the Pascal or C compilers separately. If you plan to do any Macintosh programming with MPW, you should arm yourself with the *Inside Macintosh* series published by Addison-Wesley, and a good set of manuals for the language of your choice. If you plan to use the assembler, you should get the microprocessor programming books published by Motorola.

As far as editing and compiling go, MPW isn't much different from any other development system. The real power shows up in the post-compile stages, during linking, debugging, and performance optimization. With some development systems, once the compiler or assembler is done, your program is ready to run. Most programs that you compile under MPW, however, are incomplete—they call subroutines that are held in library files, and which must be linked to your program before it can run. Many of the run-time functions, for example, are held in a library. You can also create your own libraries of frequently used subroutines.

The final stages of program development in MPW involve debugging and optimizing. Very few substantial programs run on the first try. MPW's debugger, MacsBug, takes control when your program loses it, letting you monitor your program's activity at the machine level. The performance tools help you see what your program is doing, giving you a variety of reports to help you locate slow or inefficient sections.

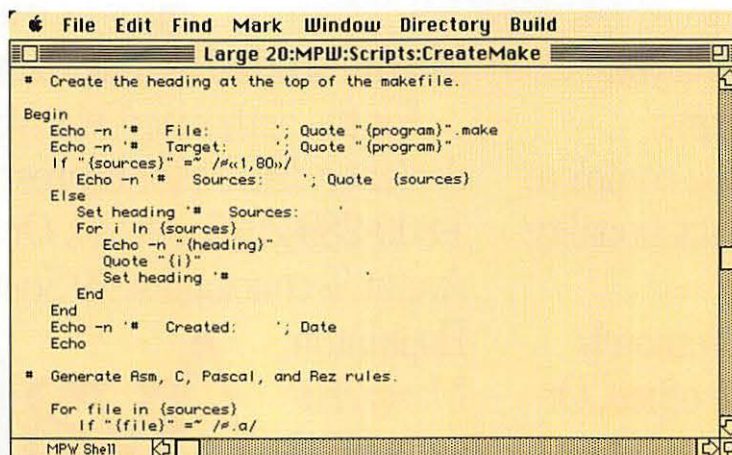
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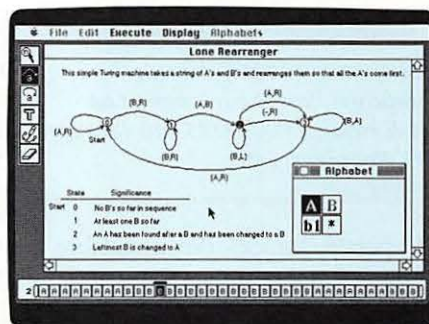
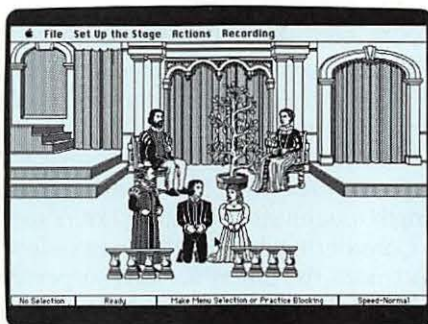
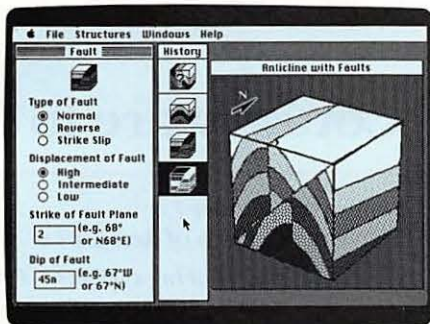
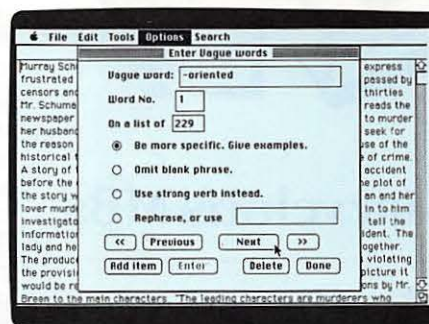
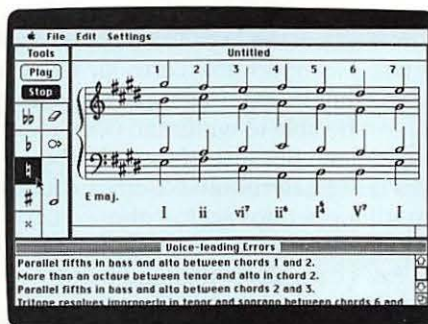
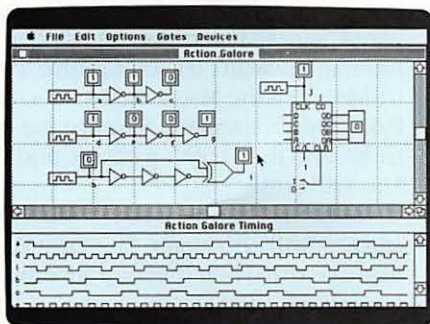
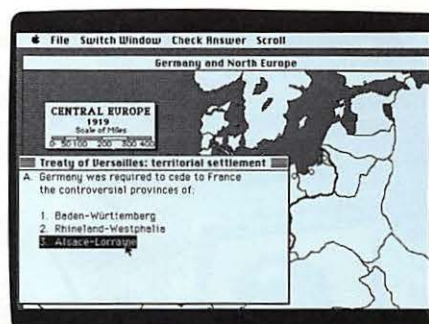
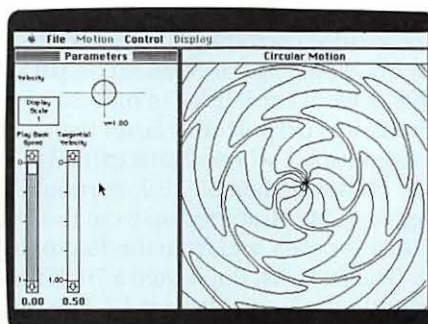
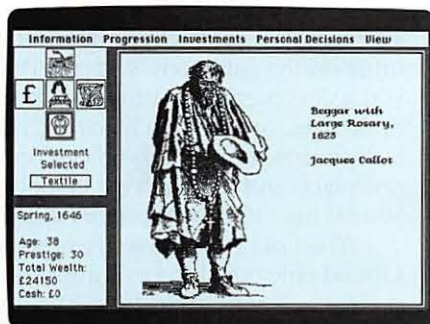
MPW is definitely a powerful and comprehensive collection of programming tools. With its integrated editor, assembler, debugger, performance optimizers, help, and additional Pascal and C compilers, it has nearly everything a programmer could ask for. But the price for such power is complexity, making it nearly as difficult to understand and use as some minicomputer systems. I would recommend MPW only if you are a professional programmer who plans to spend a lot of time building applications.—Ken Takara

See *Where to Buy* for contact information.

Writing a Script

Scripts are programs for the MPW Shell written in the Shell command language. Scripts are highly versatile—you can build them, for example, to compile, link, and test a program or to clean up your disk. MPW uses this script to create and display one of its own menus.



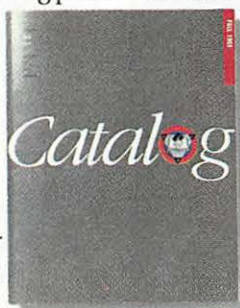


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45 Marvelous MBs

Data Pak

45MB removable hard disk. **Pros:** Compact and fast; one cartridge holds up to ten password-protected partitions; many thoughtful design touches. **Cons:** System hangs if cartridge is removed. **Company:** Mass Micro Systems. **List price:** One-cartridge drive \$1775; two-cartridge drive \$2995. **Requires:** 1 MB.



HyperCard stacks, downloadable fonts, complex applications, and swelling System folders are giving Macs a voracious appetite for disk space. While many 20-megabyte hard disks are still available, units offering 30 or 40 megabytes have become commonplace.

An even better weapon against "disk full" errors is a removable drive such as Mass Micro Systems' Data Pak. The standard Data Pak houses one 45MB removable hard disk cartridge; for insatiable sector-swallowers, models holding either two cartridges or one cartridge and a 40MB, 80MB, or 120 MB fixed hard disk are also available.

There's a lot to like in a Data Pak. It fits under a Plus or an SE and—thanks, Mass Micro—tilts your Mac slightly. You can change Data Pak's SCSI address with a convenient back-panel switch; the panel also includes two spare power outlets controlled by the Data Pak's power switch. The drive doesn't whisper, but it's quieter than most hard disks—my SE outwhines it. And it includes a utility that lets you divide it into as many as ten partitions, which you can selectively mount and unmount.

The Data Pak is also fast. Its removable cartridge contains a single hard disk platter that offers performance comparable to that of fixed hard disks. In my tests the Data Pak was considerably faster than a Berling Totem drive, whose 20MB cartridge is based on slower, flexible-disk Bernoulli technology. My SE started up from the Data Pak in 11 seconds, and from the Totem drive in 18. The Data Pak duplicated a 700K file in 9 seconds, the Totem drive in 17. The Data Pak saved a 135K Microsoft Word document in 47 seconds; the Totem drive took 52.

Next, I put the Data Pak through a torture test. Any removable cartridge that can hold roughly 15,000 single-spaced pages of text must be able to withstand occasional mistreatment. Because of their flexible-media design, Bernoulli-based cartridges keep stiff upper lips against abuse. Hard disk platters are more sensitive, but the Data Pak's cartridge withstood being dropped—even thrown—to a carpeted floor. Some months ago, I stood on a removable disk cartridge from Century Data's tank-tough PhD drive (see *Reviews*, *Macworld*, May 1988). I wanted to do the same with a Data Pak cartridge, but its plastic case groaned for mercy, and I backed off. The Data Pak can withstand everyday bumps and jolts, but it lacks the industrial-strength toughness of Century Data's media. Considering that the PhD costs a few grand more, the difference isn't surprising.

The Data Pak doesn't include custom backup software, but it works with Apple's HD Backup and with generic backup programs such as SuperMac's DiskFit. The utility included with the drive lets you format, test, and partition cartridges. You can specify the size of a partition and assign it a password to protect against pillaging. Unfortunately, you can't resize a partition later; instead, you must back up the partition, delete it, and create a new one.



Data Pak's 45MB removable hard disk.

Most hard disks that allow partitioning supply a desk accessory for mounting and unmounting partitions. With the Data Pak, you access partitions using the Chooser desk accessory. That's a nice touch: it logically keeps your system-related options in one place, and it doesn't eat up one of your System file's 15 desk accessory slots.

The Data Pak is so well executed that I found only one thing to complain about: you can eject the cartridge without the Mac's knowing it. Some removable drives know when their media is AWOL and display a "please insert disk" message; or, they simply won't let you remove the cartridge when the Mac is in use. The Data Pak lacks such smarts. Remove the cartridge and then try to access it, and your Mac will crash.

But that's a minor flaw, which only the careless will encounter. The Data Pak is a first-rate drive that I recommend without hesitation. —*Jim Heid*

See *Where to Buy* for contact information.

Courseware to Go

Course of Action 1.0

The Best Course of Action 1.0

Courseware authoring systems. **Pros:** Icon-based language; interactive debugging; powerful calculation capabilities. **Cons:** High price; limited drawing tools; special student disks needed for courseware distribution. **Company:** Authorware. **List price:** Course of Action \$695; The Best Course of Action \$2500. **Requires:** Mac Plus; hard disk recommended.



Ask a Macintosh consultant to recommend a system for writing instructional programs, and chances are it will be HyperCard. But HyperCard has major limitations as a course-authoring language, especially when it comes to response processing and animation. So what other choices are there? Course Builder, from TeleRobotics International, was the first courseware package for the Mac (see *Reviews*, *Macworld*, December 1987). Now, Authorware has come up with Course of Action.

(continues)

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The Best Course?

In its basic configuration, Course of Action includes most of the tools needed in a fully functional authoring system, but it lacks advanced animation, sound, and interactive videodisk capabilities. The deluxe version, called The Best Course of Action, adds the Impulse sound digitizer and software, a videodisk driver, and a set of advanced animation tools.

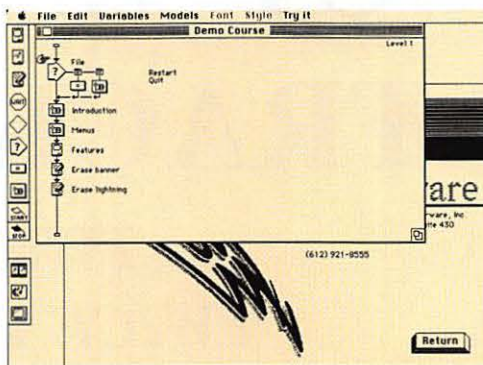
Like Course Builder, Course of Action is an icon-based language; each icon represents some sort of program action, such as displaying text or graphics, accepting a response, or performing a calculation. You add icons to a course by dragging them from the tool palette to the course design window, where they snap into place along a line that represents the course flow (see "Snap Set-Up"). Course of Action follows the standard Macintosh guidelines for selecting, cutting, and pasting icons. As the course grows, you can group any number of icons together and paste them into a single Map icon to keep things manageable. If you're clever about naming icons as you go, the design window becomes a self-documenting flowchart.

Capable Icons

Course of Action's basic repertoire includes displaying and erasing text and graphics, simple animation, pausing, branching, answer processing, and calculation. The Display function is the one you're likely to use most often. Double-clicking on an icon representing one of these functions opens the presentation window, where all the action takes place when a course runs.

Using a set of MacDraw-like tools, you can enter text or graphics into the presentation window. Bitmapped graphics must be imported via the Clipboard, and the current version doesn't handle gray scale or color.

You use the Animation icon to move objects in the presentation window. Course of Action's limited animation capabilities let you choose only a starting and an ending position for an object's motion. The Best Course of Action adds powerful functions that are indispensable for simulations: for example, you can specify a precise path for an object to follow or link an object's motion to the value of one or more variables. The advanced animation package



Snap Set-Up

Icons from Course of Action's repertoire are added to a course by dragging them to the course design window, where they snap into place. Interaction with the student takes place in the partially hidden presentation window.

includes an application for creating simple movies like a spinning beach ball. (The Movie Editor is actually a repackaged form of Ann Arbor Softworks' old Animation Toolkit—it's definitely no competition for VideoWorks, but it's still serviceable.)

The Best Course of Action also has impressive sound capabilities. Digitized sounds can be set to play as many times as needed, at any playback speed. The Impulse sound digitizer and SoundWave software make recording and editing sounds easy.

Response processing is another strong point. Text input, mouse clicks, menu selections, and push buttons are all acceptable as answers, and you can mix any number of them in a single question. Course of Action also lets you determine if a student has moved a graphic in the presentation window to a specified area, which comes in handy in exercises where the student has to assemble a piece of apparatus (say, an automobile engine) by dragging its component parts to their correct locations.

Course of Action also excels in its calculation capabilities. The extensive library of variables and functions should please even die-hard programmers. If you're not satisfied, you can make up your own variables and write customized external functions in Pascal or C. Although not many au-

thors are likely to use all of the variables and functions, it's nice to have them available for complex tasks like simulation.

Courseware Made Easy?

All in all, I found Authorware's products more flexible than Course Builder. Flexibility is essential since course authoring and execution are intimately tied together and you need to jump back and forth between the course design and presentation windows as you go. In fact, Authorware suggests that you program a course by experimenting as much as possible. The documentation is among the best I've seen for any type of software, guiding you through all the steps with plenty of examples. Still, creating effective instructional software isn't an easy process—expect many hours of hard work for every hour of courseware.

Course of Action's biggest drawback is the manner in which courses are distributed to students. In the current implementation, courses have to be individually packaged on proprietary, copy-protected floppy disks. (They're available from Authorware at \$65 for ten disks.) The trouble with this system is that there's no easy way to accommodate courseware that doesn't fit on one floppy—a not unlikely prospect if a course contains a lot of graphics. Authorware is now working on ways to run courseware from a network, a setup I think most users would prefer.

Another major problem is that \$695 is a lot of money for just the basic version. And at \$2500, The Best Course of Action is up in the price stratosphere usually reserved for hardware vendors. To be fair, Authorware does offer major discounts to educational institutions (bringing the prices down to \$495 and \$1750 for the basic and advanced versions, respectively), and additional price cuts are available for volume purchases. Still not exactly a bargain, though.

There's no doubt that The Best Course of Action is the most capable course-authoring package available for the Mac, if you can live with the cost and Authorware's inconvenient software-distribution scheme. If, however, you can get by without advanced animation, sound, and videodisks, Course of Action is a good second choice. —Franklin Tessler

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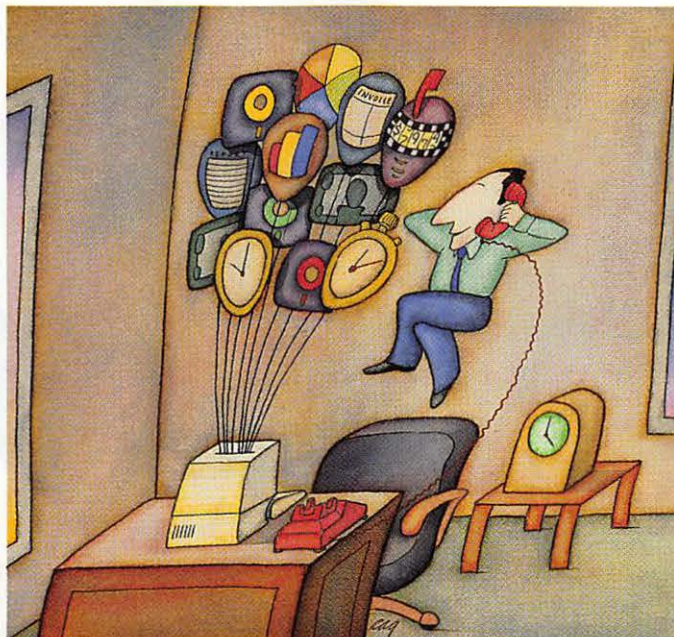
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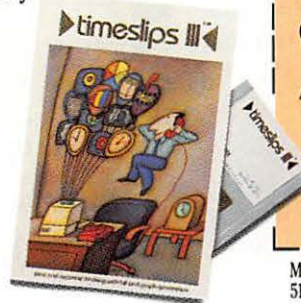
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MAC 988

Minimum Requirements: Macintosh Computer with at least 512K and either 2 floppy disks or 1 floppy and 1 hard drive. Compatible with MAC II.

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Teaching a New Dog Old Tricks

SoftPC 1.2 (standard version)

IBM PC XT emulator software for the Mac II and SE (with accelerator card). Pros:

Runs most popular MS-DOS programs; utilizes the mouse when the PC application allows one; compatible with MultiFinder; excellent installation guide. Cons: Drive and load time is slower than a PC's; requires access to a 5¼-inch disk drive; knowledge of MS-DOS commands required. **Company:** Insignia Solutions. **List**

price: \$595. **Requires:** Mac II with 4MB of RAM (small version available for Mac II and SE with accelerator card and 2MB of RAM); 3MB hard disk space; System 4.3 and Finder 6.0; Apple 5¼-inch PC drive or customized cable to connect to a "real" PC in order to load MS-DOS software.



If you ever need to explain ease of use to someone, put a Mac next to a PC. Better yet, open the SoftPC window on your Mac II and compare software side-by-side.

You can do this with Insignia Solution's SoftPC 8086 all-software emulator. SoftPC has no hardware component; there is no add-in board to take up a NuBus slot. Yet SoftPC successfully emulates an MS-DOS-based, IBM PC-compatible computer complete with CGA (Color Graphics Adapter, 640 by 200 resolution), Microsoft Bus mouse, two serial ports and one parallel port, support for one floppy and two virtual hard disks, and a "drive" designator that gives access to the Mac file system.

During an installation process that takes all of 15 seconds, SoftPC creates on disk a 1-megabyte Macintosh file that it uses as its C-drive hard disk. You can create another virtual PC hard disk on your Macintosh hard disk from 1MB to 32MB (the upper limit of MS-DOS).

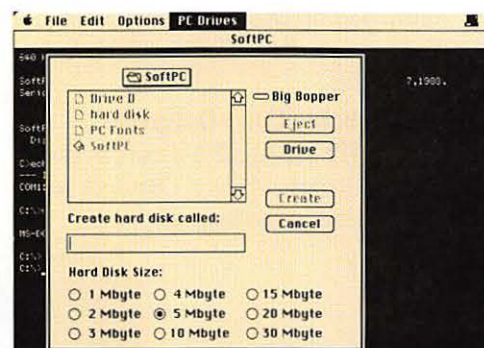
And it all works—pretty well, anyway. Certainly, SoftPC provides acceptable performance for the occasional uses that a Mac II owner might have for it, such as running an MS-DOS vertical-market business package, for example.

Roll Over!

Although some alleged PC compatibles run only software that is well-behaved under MS-DOS, Insignia claims to emulate

a PC "down to the chip level," so that ill-behaved software feels right at home. Insignia's list of about 75 popular PC applications it has "tested" includes Lotus's 1-2-3, Microsoft's Flight Simulator, and "terminate and stay resident" programs such as Borland's Sidekick, which act as DAs of a sort.

My compatibility test consisted of a vile brew of 1-2-3 version 2.01 and a new 1-2-3 project-management add-in called ProjectCalc, which plays hopscotch with the 8086's segment registers—craming more than 340K of programming into a space that Lotus originally intended for 64K of code. SoftPC handled all this internal prodding and poking and ran flawlessly.



A New Hard Disk

SoftPC emulates a hard disk—with a complete directory system—in a single Macintosh file. It automatically creates this virtual 5MB hard disk to contain MS-DOS and other system files when you install it.



Play Dead!

The ubiquitous Norton Utilities package rates SoftPC at 1.3 times the speed of a standard IBM PC. That may be the case for internal math calculations or text operations, but for file loading or copying, spreadsheet recalculations, and especially graphics, SoftPC runs at about 60 percent the speed of a PC. For example, to load a 9443-byte worksheet file from drive A into 1-2-3 and recalculate it on the PC took 27.5 seconds. To do the same with SoftPC (using an Apple 5¼-inch PC floppy) took more than 45 seconds. This leisurely pace may be irritating if you're used to working at the 16-MHz speed of the Mac II.

That you're dealing with a software emulation is especially apparent with on-screen graphics. Text response on screen was very good, but graphics response using SoftPC was unquestionably slower than on a comparably equipped IBM PC.

Getting your MS-DOS software into SoftPC is another issue that should be considered, because the Mac II's 3½-inch floppy drives can't read or write IBM's 3½-inch format (no fault of SoftPC here). You have three choices: use Apple's 5¼-inch, PC-format floppy drive; rig a serial cable between your Mac and a bona fide PC to use the PC's floppy drive; or key in any program yourself. You should count on having a 5¼-inch floppy available somehow when

(continues)

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running SoftPC. (Many MS-DOS programs use a "key disk" system of copy protection.)

SoftPC supports PostScript printers as such only when the particular PC application does. Otherwise, it pretends whatever printer you have is an Epson FX-80.

Speak!

If you plan to do daily production work with MS-DOS programs—for instance, if you decide to standardize the company on a package with heavy disk utilization such as dBase III Plus—an 8086 or an 80286 PC add-in board may be the ticket for you. But SoftPC is certainly the most cost-efficient way to go. Despite any questions of speed or floppy disk requirements, this is the package to have if you need occasional access to MS-DOS programs.

—Jeff Walden

See *Where to Buy* for contact information.

Almost Fun Backups

Redux 1.0

Backup program. **Pros:** Flexible file filtering; simple incremental backups; backs up to all types of HFS volumes. **Cons:** No alert if wrong disk is inserted; can't rename backup disks; backup disks are useless if directory is damaged. **Company:** Microseeds Publishing. **List price:** \$99. **Requires:** 512KE.



Backing up a hard disk is like buying insurance: it seems like a waste until you need it. Backup programs make the chore easier and faster. Even more important, they let you back up files that wouldn't ordinarily fit on an 800K disk. Redux almost succeeds in making backups fun.

Simple Backups

Redux begins by asking you to select a source volume (the drive you're backing up from) and a target volume (the drive you're writing to). Once Redux knows the target's capacity, it gives you an estimate of the number of volumes the backup will take. If all your files can fit on one target volume, Redux lets you copy them in a Finder-readable format; otherwise, Redux

saves them in a special format that only Redux understands. Any type of HFS-compatible storage device can serve as a target, including floppy drives, removable media, tape units, and hard disks.

The first time you back up a hard disk to floppies, Redux prompts you to insert disks until it has copied all the files. If you're interrupted, you can pick up later where you left off. Although Redux runs under MultiFinder, this may be more trouble than it's worth—for example, Microsoft Word's response time dropped noticeably with Redux running in the background. Restoring a hard drive is as simple as feeding in backup disks when Redux prompts you.

Power Backups

What if you don't want to back up those letters to Mom? No problem—Redux provides an extensive set of file-filtering tools. Working from a list of all the files on a hard disk, you can mark any file or folder for backup (see "Checking the List"). You can automatically include or exclude files according to almost any criteria, including name, modification date, and file type. As you refine the backup list, Redux writes a script in a simple procedural language: you can modify that script or write your own by following the rules of syntax described in the manual. Because Redux saves the script on the first target disk, you don't have to re-create it each time you do a backup.

Some programs force you to back up all the files on a hard disk even if only one has changed since the last backup. More sophisticated applications provide for incremental backups, which save only files that have been modified. Unfortunately, the inventory of backup disks grows larger

with every session if you don't reuse old disks. Redux uses existing backup disks whenever it can, keeping the set to a manageable size. In fact, incremental backups are so easy that you're likely to do them more often than you might otherwise.

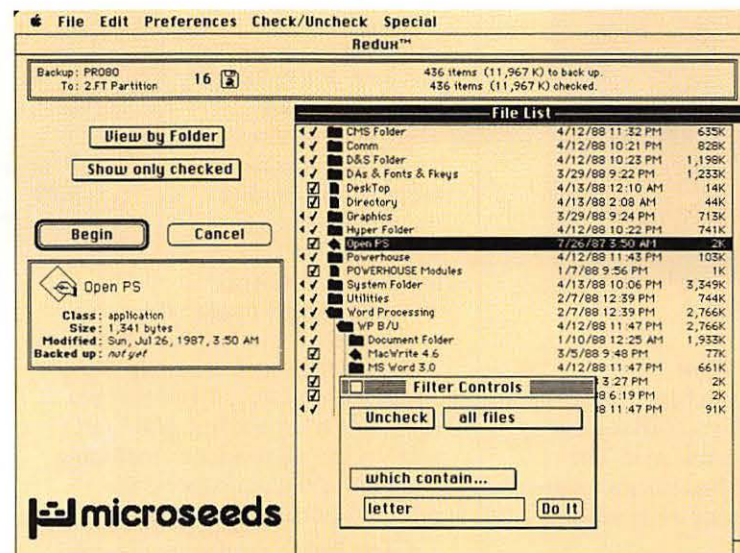
Redux has a few minor problems. If you insert the wrong backup disk, Redux doesn't alert you, it just ignores the disk. Also, you can't change the default name for backup disks, an option that would aid people who keep multiple backup sets. There's one other, potentially more serious, problem: the first target disk contains the only copy of the backup directory—if it's lost or damaged, the entire backup set is useless.

In a speed comparison with other popular programs (see *Reviews*, March 1988), both Redux and HFS Backup 2.02 took 19 minutes to back up 10 megabytes onto floppies. With write verification turned on, the same backup took Fastback 1.02 only 14 minutes (a 26 percent savings), but it used two more floppies. Restoring the same 10MB took all three programs about 8 minutes. Redux consistently rejected damaged disks without missing a beat.

Because of the transparent way Redux handles incremental backups, I'd choose it over Fastback even though Redux is slower. And because of its sophisticated file-filtering functions, I also prefer Redux to SuperMac's DiskFit. Does Redux really make backups fun? Well, not really. (I said *almost*, remember?) But it's an excellent choice for backing up to any type of storage device.

—Franklin Tessler

See *Where to Buy* for contact information.



Checking the List

Redux checks folders and files targeted for backup, but saves only the ones that have changed since the last backup session. Redux's powerful filter controls let you add or delete files that meet specific criteria from the backup roster.

How to Buy the Right Monitor.

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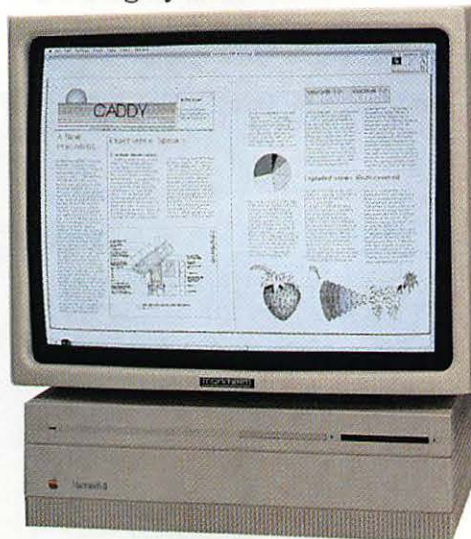
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Circle 133 on reader service card



Power the Hard Way

LaserPaint Color II

Color drawing, painting, page-layout, scanning, and separation program. **Pros:** Includes virtually every graphics tool you need; does color separations; handles TIFF and PostScript files; supports Pantone color matching; built-in scanning module; customizable icons and palettes. **Cons:** Interface still has problems; Undo doesn't work in most situations; key-disk copy protection (unprotected disk available to registered owners for an extra \$25). **Company:** LaserWare. **List price:** \$595. **Requires:** Mac II; 256-color card; 5MB recommended; (Sharp JX-450 or Houtek scanner; 24-bit color card recommended for professional system).



When *Macworld* looked at the monochrome version of LaserPaint (see *Reviews*, *Macworld*, September 1987), we concluded that LaserPaint was powerful but almost unusable due to its strange interface. LaserPaint's newest incarnation, Color II, is even more powerful, and some of the more distressing interface problems have been alleviated. LaserPaint Color II is the only program that combines all of Adobe Illustrator's drawing features with high-end painting, scanning, and color-separation features found only in stand-alone specialty applications such as MacPaint, MacDraw, and ThunderScan. (All these features are also available in another monochrome version that runs on a Mac Plus.)

More Features

LaserWare has added a cornucopia of key features to the already sophisticated drawing, painting, and text-manipulation abilities of the original program. Highlights include automatic four-color process or spot-color separations from drawn, painted, or text objects; the ability to use the Pantone Matching System when manipulating the color palette; direct editing of halftones; and MultiFinder and network support. In addition, the performance of many tools is much better than it was in LaserPaint.

For intricate, precise drawings, the Drawing toolbox provides bezier curves, circles, squares, arcs, spirals, lines, pat-

terns, and fills. LaserPaint Color II works a lot like an enhanced MacDraw in this mode. Alternatively, you can use the Painting toolbox to manipulate a bitmap directly. LaserPaint Color II provides all the MacPaint-like tools you can think of and even lets you work on bitmaps at 72 to 600 dots per inch (dpi)—that's twice the resolution of the LaserWriter. The Writing toolbox lets you automatically run text around, inside, or over any object. You also get full kerning, leading, and color control, with font sizes up to 7000 points.

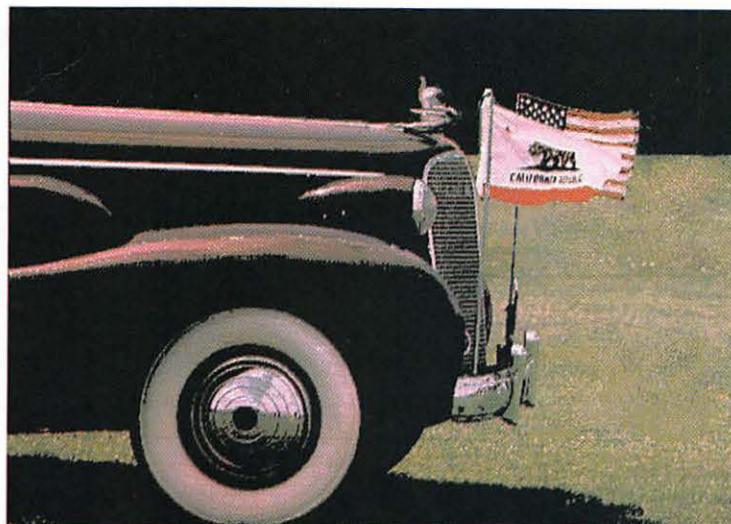
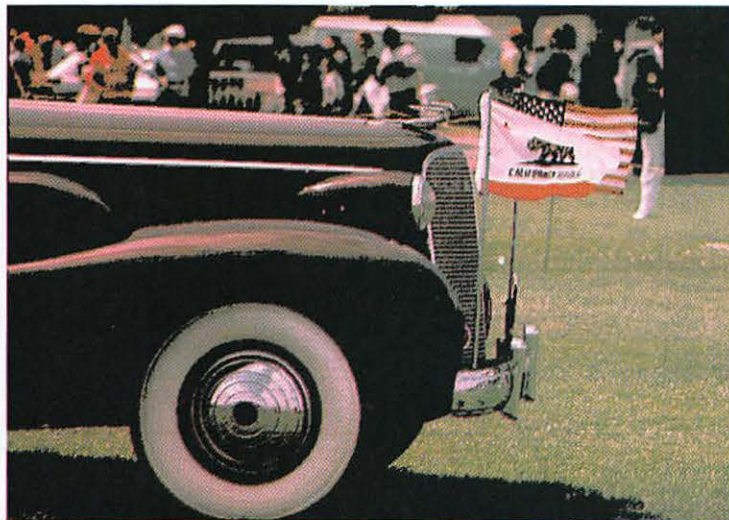
Putting It All Together

LaserPaint Color II really shines when you use these tools with one another—a real advantage over using several individual packages. For instance, if you've got a color picture that you want to scan and then add a few garnishes to, LaserPaint Color II can handle the whole job, including producing a final color separation.

With a Sharp JX-450 color scanner attached to your system, you can scan anything from line art to halftones and color art at anywhere from 72 to 300 dpi. If you're scanning a color image, you may also select 8-bit, 24-bit, or Pantone representations, which are calibrated to the AppleColor monitor and card. Alternatively, you can import TIFF, MacPaint, PICT, or PICT2 files for manipulation.

To remove extraneous details from a scanned image, you select the Painting toolbox, select the object to be manipulated, and then make changes with one of the Paint tools. In "Cleaning Up an Image" I used the airbrush to do some large-scale changes and the pen to touch up the results bit by bit. Note that I've softened the edges of the original by using gradual shifts in color. The zoom function proved extremely helpful by letting me work

(continues)



Editing an Image

This TIFF image was scanned in from a Barneyscan color slide scanner. The top picture shows the results of using the marker, airbrush, and pen tools to erase half of the man in the upper right. The bottom picture shows the image after the entire background was edited. Generally, the best effects are obtained by working with the crudest tools first (for example, the marker) to apply broad swatches of color, then using finer tools to dither and blend colors. Another approach would be to remove the extraneous background (by making it white) and then add a new background in a different layer. LaserPaint Color II's impressive array of tools doesn't limit you to one approach—you can select the method that works best.

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with many tools at up to eight-times magnification.

Once you've cleaned up the original image, you can begin using other tools to add new details. LaserPaint Color II, like most sophisticated graphics programs, works in layers. The scanned image is one layer. You can draw and add text in other layers so that you don't have to worry about accidentally changing the scanned image while making additions. Unfortunately, working in layers can be confusing if you're not accustomed to it—since you can always see each object in each layer, it is frustrating not to be able to access any object immediately. Moreover, LaserPaint is not very good at indicating which layer you're working on (for instance, the program often indicates a layer by drawing a thin box around it, but the box doesn't necessarily appear on screen). So it's highly likely that you will end up inadvertently making a change on the wrong layer. Although you can lock objects to prevent unintentional changes to them, the lock function doesn't provide any feedback to help you distinguish between locked and unlocked objects.

Changing Habits

Using LaserPaint Color II is both a frustrating and a satisfying experience. The satisfaction comes from the power of the tools provided. No other Macintosh product comes close to the number of features LaserPaint Color II provides for manipulating graphics. The frustration comes from the still-not-quite-Mac-like interface that you must use to access many tools.



The program has flaws, which tend to get in the way at the wrong moment (for instance, just when you think you're finished with a graphic, a tool will do something you don't want it to, and you must redo a significant portion of your work). Once, the paintbrush began "flowing" more paint than I expected; LaserPaint Color II automatically resets the flow to the last setting used, instead of allowing you to set an easily remembered default. LaserWare supplies the original manual plus a 64-page update. But because the program has been dramatically upgraded, the old manual is confusing and the update leaves entirely too much information to your imagination.

One of the more aggravating aspects of the interface is an Undo feature that works only for a few drawing and text functions and has no effect on the painting tools, where it would be most useful. In addition, the drawing tools function a bit differently than you would expect (for example, to create a bezier curve, you must enter the first anchor point, the bezier manipulation point for it, the bezier manipulation point for the second anchor point, and then the second anchor point—in that order). The program also deselects objects unpredictably, so you end up changing an object other than the one you thought you were working on. And handles that show which object is currently selected are often too subtle or overlap other elements, making it difficult to tell what you're working on.

Power at a Price

Whether or not you decide to buy LaserPaint Color II depends on how well you can get along with its eccentricities. Having to think about what LaserPaint Color II is likely to do at each step of the way steepens the learning curve considerably. You'll have to really want or need LaserPaint Color II's features to justify adjusting your work habits and spending the extra time to learn its idiosyncrasies the hard way.

Yet, in a single application, LaserPaint Color II provides the functionality of four or five other programs, thereby actually transforming its seemingly high price into a bargain. For manipulating color scanned images, LaserPaint Color II provides an array of features that no other product can equal. Even if you're only interested in monochrome line drawings and paint images, LaserPaint has features that make it worth looking into.—Cheryl Spencer

See *Where to Buy* for contact information.

Acceler-rating

DoubleTime-16 2.0

SpeedCard 1.6, PROM 4.01

Macintosh SE accelerator cards. Pros: Simple upgrade improves SE performance on standard tasks. Both boards compatible with nearly all software. **Cons:** Actual speed enhancement depends strongly on application. **Companies:** Aox Software (DoubleTime-16) and SuperMac Technology (SpeedCard). **List price:** DoubleTime-16 \$395; SpeedCard \$395 (\$699 with 68881). **Requires:** SE.



The Aox DoubleTime-16 and the SuperMac SpeedCard are based on a simple premise: double the Mac CPU clock speed with an upgraded processor and perhaps you can double application throughput. Can you really double the speed of your SE for \$400? Well, almost.

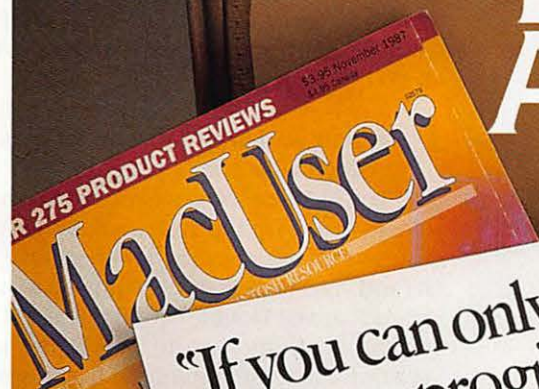
These low-cost accelerators use many of the same tricks—both are designed around the 16-MHz 68000 chip in your SE, but they run at twice the speed. Both load the most frequently used instructions from an application into a fast RAM cache, and both support a 68881 math coprocessor. The 68881 chip, however, was designed to work with the 68020 processor in the Mac II and can have problems in the SE. Furthermore, the impact of the faster processor and cache appears only in operations where CPU speed is the only factor. If your operation requires extensive disk input/output, for example, the CPU speed-up won't improve actual application speed much.

First, the Good News

A look at "Fast, Faster, Fastest" shows that an accelerator board offers you additional productivity for your money. Instead of the types of computing benchmarks used for compilers, which tend to measure manipulation of small amounts of data and will exhibit a clean doubling of speed for both boards, this comparison uses programs from *Macworld's* best-seller list. The Microsoft Word test is a search-and-replace for 200 occurrences of a word in a 50K text file, the Excel recalculation refers to a 120K spreadsheet loaded with functions, and the Cricket Draw example is a

(continues)

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MacUser, Nov. 1987

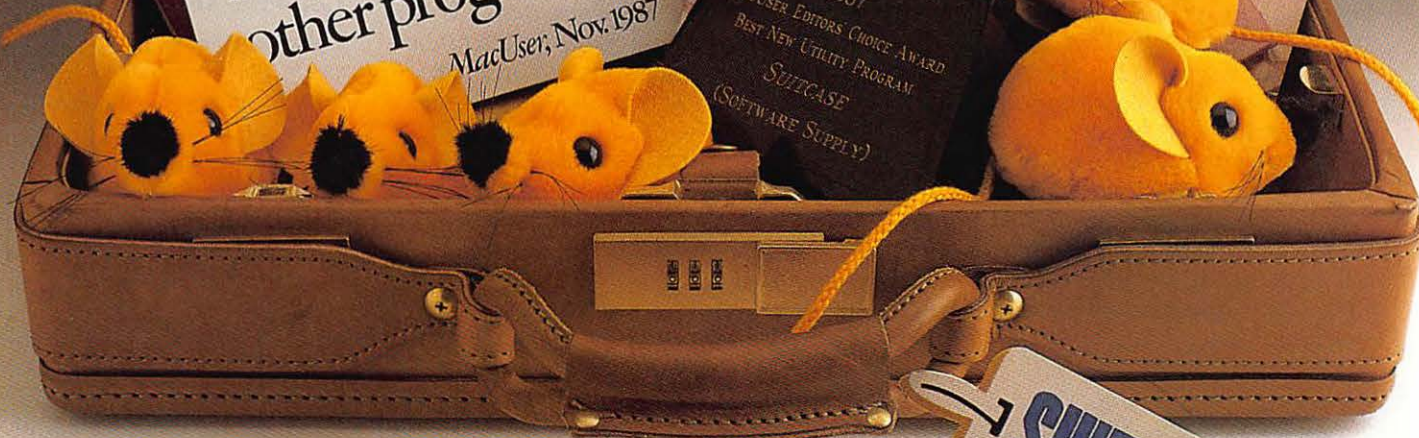
"...for virtually unlimited numbers of fonts and desk accessories, there is simply no better utility than Suitcase."

MacWorld, Dec. 1987

COLOR MONITORS! HARD-DISK

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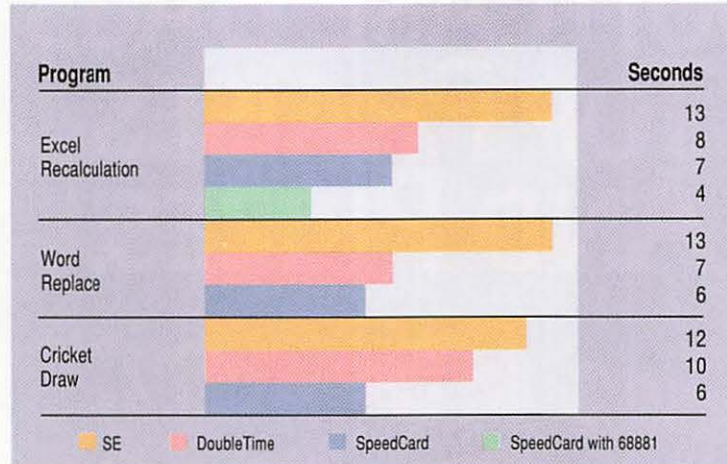
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On most benchmarks, the SpeedCard has a slight edge over the DoubleTime-16 board. The most important point is that the expected "factor of two" effect from the 16-MHz CPU may or may not apply to the program that interests you.



screen redraw of a complex shaded figure. The database functions (on a 5000-record file in FoxBASE+/Mac) are indexing, skipping records, and seeking records.

What you get is nearly a factor-of-two increase in simple word processing tasks, anomalously good performance on small special tasks that use the RAM cache, no improvement (even deterioration) on I/O-bound tasks, and speed increases of 20 to 100 percent on other chores. With a math coprocessor, the SpeedCard's performance with Excel and FoxBASE+/Mac functions is commendable, although of course it's not competitive with SuperMac's top-of-the-line 16-MHz 68020 Prodigy card. (The system software support for a DoubleTime-16 68881 was not ready at press time.)

Currently, the SpeedCard is more evolved and more competent than the DoubleTime-16 and features such accessory-board rarities as stable system software and an outstanding installation manual. In general, though, with either card, the SE feels snappier by a pleasant but not startling amount.

And Not So Good

A 68000 chip and a 68881 math coprocessor combination is not the optimal way to exploit the power of the 68881, and in some cases it's no way at all. Specifically, if the application uses calls to the Standard Apple Numerics Environment (SANE)—a method that is slower than direct access—the board speeds up numerics by a factor of three to six. If the application doesn't route mathematical calls through SANE, however, there may be no computational improvement. Although Excel can find a 68881 on these boards and use it, many scientific and engineering programs are specifically written for a 68020/68881 combination and, therefore, won't run on an SE enhanced with a faster 68000 chip and a math coprocessor.

Additionally, these investments, modest though they may be, are not recoupable. If you purchase the appropriate SIMMs, you can expand your SE's memory immediately, then use the same SIMMs in a Mac II if you upgrade. The accelerator boards, however, represent a purchase that

stays with your SE forever. With added memory you can comfortably run HyperCard under MultiFinder, or you could get performance improvement in many applications (particularly database and page-layout programs) by using a large RAM disk. So there are alternative upgrades for \$400 that you may find more practical.

Clear and Simple Instructions

Here's what you need to do. First, find the one piece of software you would most like to speed up, typically something you use several hours every day. Next, take it (and your favorite files) with you to a SpeedCard or DoubleTime-16 dealer. Then try that application on an SE with the accelerator for at least 15 minutes. If at the end of 15 minutes, you still think your application feels "accelerated," you have found a winning combination. If not, you may be in the market for more memory, a hotter accelerator, or a Mac II sometime in the future.—Charles Seiter

See *Where to Buy* for contact information.

Color for the SE?

ColorVue SE

Color video card for the SE. Pros: Allows you to attach external color monitor to the SE; provides color for some applications. **Cons:** Offers only eight colors; color handling is primitive; slow redraw; crashes with some software.

Company: Orchid Technology. **List price:** \$695. **Requires:** Mac SE; 13-inch multisync monitor; VGA monitor, or AppleColor monitor.



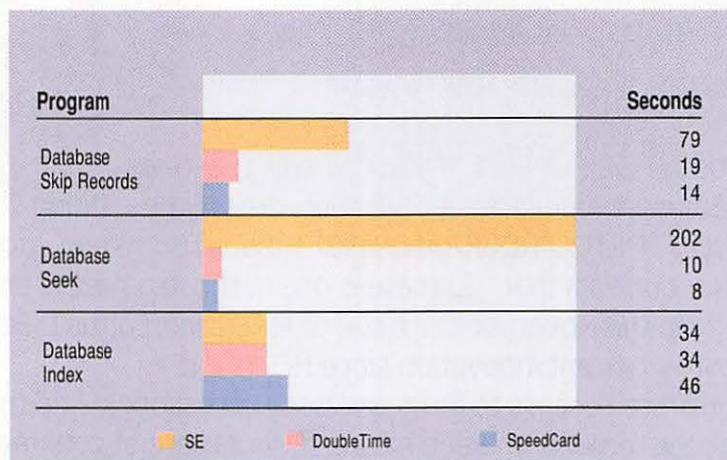
For users who want some color on their Macintosh SE, Orchid has released a video card, ColorVue, that allows you to attach a color monitor. Although Orchid does not attempt to mislead the public about ColorVue's capabilities, most people still expect the card to run color applications just as the Mac II does. That expectation, however, is a far cry from the reality.

Unlike the Mac II, which uses Color QuickDraw to display color images, ColorVue gets its color information from regular

(continues)

Fast, Faster, Oops

A 68000 accelerator board dramatically speeds up database seeks and record skipping. But for indexing, the DoubleTime-16 card runs at the same speed as the standard SE, while the SpeedCard actually slows operations.



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Circle 462 on reader service card

QuickDraw. The original Mac incorporated QuickDraw primarily to drive an ImageWriter II that had a color ribbon; therefore, ColorVue's color abilities are very primitive. Only eight colors are available—not 8-bit color, as with the Mac II—but *eight colors*, as in a small box of crayons. Furthermore, since printing in color on the ImageWriter has never been very popular, few programs support the feature, and those that do make it obscure (for instance, by placing it in the print preview area).

Colorizing a graphic usually consists of selecting an object, then selecting a color for it from a list. There is no color wheel to choose colors from, and you can't blend colors to create new ones. This is extremely different from working with the sophisticated color-handling abilities of the Mac II.

Putting It Together

Installation is straightforward; the ColorVue video card fits in the SE's one expansion slot and provides two sockets—one for attaching the AppleColor monitor or a 13-inch analog multisync monitor (such as ones from Sony or NEC), and one for attaching an IBM-style VGA monitor. The manual provides good instructions on installation.

I did, however, have some trouble getting ColorVue to work. When I was still staring at a dark screen after an hour's effort, I carefully reread all the documentation. Although the manual states that a Sony Multiscan monitor is compatible, a

typewritten addendum informed me that I needed to buy a new cable, one that normally connects the Sony to an IBM VGA video card. This seemed like a strange thing to expect Mac users to figure out, but then I remembered that Orchid normally makes products for the IBM PC—ColorVue is the company's first Mac product. This was only one of many bits of inaccurate information I ran across in the manual.

You access ColorVue's controls through the Control Panel. You can choose 2, 8, 16, or Auto colors (I am unaware of any software that works on ColorVue in 16 colors). You can set the colors to match those of the ImageWriter II or the Hewlett-Packard PaintJet, or set pure color.

Auto color returns your screen to monochrome when color isn't being used—a handy feature for speeding system performance since screen redraw slows considerably in the color mode. For instance, a very small (9.5K) Cricket Draw image took 11.8 seconds to redraw on an SE. The same image took an extra 7 seconds to redraw in 8-color mode with ColorVue, and nearly twice as long in 16-color mode. (The image was displayed at the same size on both the SE screen and the 13-inch screen.) More complex graphics take longer to redraw.

You can have the SE screen active, the external monitor active, or both active. There is little reason to have both monitors on at once, however, since they display matching images (including two active cursors), albeit at different resolutions. Al-

though the manual states that the card provides the external monitor with the same resolution as that of the 13-inch monitor on the Mac II—640 by 480 resolution at 72 dots per inch—the external monitor's resolution is actually lower. I'd guess that you get only 55 dpi. This apparently casual choice of screen resolution removes an advantage you would expect from an external monitor: having more information displayed on the screen.

What Works?

Some work sessions went fairly smoothly with ColorVue, but most were disappointing. For one thing, the ColorVue card does not allow you to view color graphics intended for the Mac II, such as PICT II files.

Usually, programs designed to run in color on a Mac II (such as FreeHand, Adobe Illustrator, and MacDraw II) bombed without opening. Those designed to run on all Macs (such as WordPerfect) grayed out access to their color controls. Running ImageStudio produced monochrome images, with patterns substituted for the gray values. Every attempt of mine to import gray-scale or color graphics into an application produced the same result—gray-scale values and colors were converted into patterns, just as they would be on the SE screen.

I did, however, produce color in some graphics programs—usually those that support color printing on the ImageWriter II (for instance, Canvas and Cricket Draw). But even here I found glitches in operation, such as part of the screen's losing its color during redraw. Since the manual offers precious little information on what applications are compatible and what results to expect (and since Orchid is working to solve compatibility problems), you should try running your applications before purchasing ColorVue.

Although the idea of a video card that allows users to run color on an SE is appealing, ColorVue has too many rough edges to make it a truly viable product. Users who can't justify the cost of a color Mac II will still probably prefer to dream about a color SE than to deal with the reality of Orchid's ColorVue SE.

—Scott Beamer

See *Where to Buy* for contact information.

From Black and White to Color

The ColorVue video card is installed in the Mac SE on the right. The color monitor on the left demonstrates the card's color capabilities.



FRED STIMSON

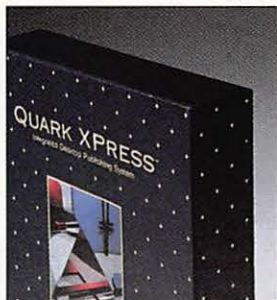
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QuarkXPress™, the complete electronic design and production environment, provides all of the resources you need to get the job done. Full featured word processing, powerful graphics editing and global search & replace functions are just a few of its exceptional features. And while QuarkXPress is already recognized for its superb typographic and layout capabilities, these convenient tools make Version 2.0 a pleasure to use. MacUser magazine thought so when it awarded QuarkXPress its highest rating for desktop publishing software.

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Quicken Easy Finances

Quicken 1.0

Personal financial management program.

Pros: Simple, quick, and easy to use; many features for its price. **Cons:** As user needs grow more complex, program loses its "simple" advantages. **Company:** Intuit. **List price:** \$49.95. **Requires:** 512K.

Now that MacMoney, in version 3.0, has joined Managing Your Money and Dollars and Sense in helping to manage personal finances, room has opened up in the POCR (plain old check 'riter) end of the market. One product that fills some of this room is Par Software's Easy Checks. Easy Checks is about as plain as a POCR can be—it pops up as a desk accessory, lets you write a check and stub note, prints the check, and disappears.

Quicken is a couple of steps above Easy Checks, even though it still won't easily manage your loans or investment portfolios. It does, however, offer features such as recurring transactions, budgeting, tracking of transactions by category (for instance, Clothing or Auto Expenses), and on-screen check reconciliation. It exports data in SYLK and HyperCard formats, and the publishers offer unlimited free tele-

phone support (you pay only for the call). That's quite a bundle of features for a product with a list price under \$50.

Simplicity Is the Key

I was able to set up Quicken without even looking at the manual. First, you set up each checking account in its own file. So if you have several checking accounts and plan to shuffle money back and forth between them, you will have to make manual transfers (or buy one of the high-end programs like MacMoney or Managing Your Money).

Next, you set up income and expense categories. The program supplies sample sets of home and business categories (which you can easily modify), or you can create your own. The program, however, does not provide any complex categories such as asset or liability. Thus, if you want to set up a credit card (liability) category, you have to make some adaptations in order to track balances in these accounts. The excellent documentation guides you through this procedure and others like it.

Data Entry

Most of your interaction with the program will be in two main screen forms: Write Checks and Enter Transactions. The Write Checks form duplicates your checkbook, with the check on the right and the stub on the left. Quicken automatically assigns numbers to the check forms when you print them out. After you fill in the check, you assign the amount to an expense category on the stub. Categories may be selected from an on-screen list (see "Writing Checks") or entered from the keyboard by typing the first few letters of the category name (a luxury not available in MacMoney). A running balance at the top of the stub tells you the status of your account.

The Enter Transactions form allows you to enter deposits and cash withdrawals via radio buttons. You can also use this form to edit entries already made in the check register (sorted by date). For instance, you can change the amount of a check or void a check.

To print checks, you simply give Quicken a cutoff date and the number of the preprinted check that is in your printer. Quicken then automatically prints all re-

Writing Checks

Quicken's check-writing screen replicates a common checkbook. You may enter categories charged by clicking on the item in the Category List, or by typing the first few letters of the category name.

maining checks. If printing goes awry (say your checks jam), you correct the problem, assign a new starting check number, and Quicken makes another pass. You can also reprint checks.

Quicken offers a good report generator that should satisfy most users. Bear in mind, however, that you're dealing with only two categories—Income and Expense (see "Transaction Reporting"). You can also print your reports, as well as create artwork for your checks, using Quicken's HyperCard stacks. The program supports LaserWriter and ImageWriter printers.

(continues)

Transaction Reporting

Transaction reports are designed on this form. Reports may be printed or viewed on screen.

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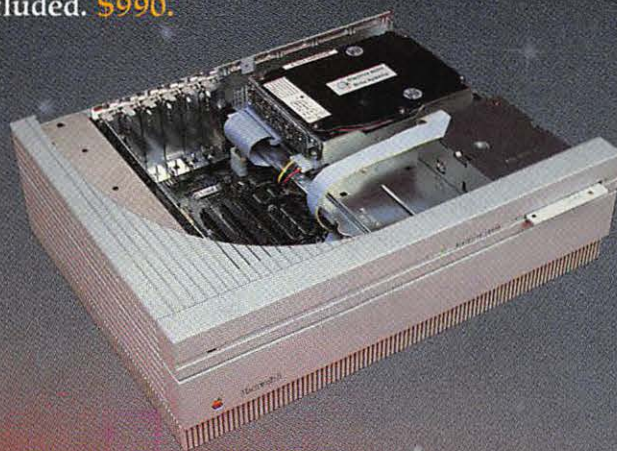


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E X T E R N A L	30DX	40ms	720.00
	40DX	19ms	1050.00
	80DX	19ms	1450.00
	90DX	18ms	1550.00
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Ruby Systems

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Fast and Easy

Quicken is a fast, easy-to-learn personal finance program that gives the user a lot of power for its price. Features like recurring transactions, budgeting, tax record tracking, and checkbook reconciliation are readily accessible. And, you can create complex transactions, such as credit card balance tracking. But the main thrust of the program is its simplicity, and the fewer complexities you introduce to your finances, the more comfortable you'll feel with the program. —Alan L. Slay

See *Where to Buy* for contact information.

Express (Yourself) Mail

Postcards 1.0

Clip art postcard designer. **Pros:** Provides disk full of humorously drawn characters, critters, and backgrounds that paste together easily into funny custom postcards. **Cons:** If you really want to make cards on your Mac, you can do it pretty easily without buying Postcards.

Company: Activision. **List price:** \$29.95.

Requires: 512K; external drive recommended.

own paint-program art or a digitized image saved in a compatible paint-program format. You can use Postcards to create birthday and holiday cards, dinner-table place cards, or any other cards you choose.

You start by loading a paint program, such as MacPaint, FullPaint, or SuperPaint. You then select a background or scene from the clip art disk and save it as a paint file. Next you open successive files containing the elements you want on your card (funny characters, buildings, captions, and so on), copy those elements one at a time to your new paint file, and paste them into place on the background you've chosen. You print the finished design and use the glue stick to stick the printed postcard to the blank postcard backing, then use scissors to trim around the postcard backing to complete your card. The whole process takes just 10 or 15 minutes, unless you are disk-swapping with a single-drive machine. (There is a mail-in coupon for additional blank postcards from Activision: \$4.50 for 50 postcards.)

Gift Packaging

Postcards is essentially a glorified clip art collection. The art is loose and comical, some of it quite humorous even uncapped-

tioned. The desert, beach, and arctic background scenes occupy costly disk space and are very similar. However, you can supplement the 390K of art supplied by Postcards with any other clip art acceptable to your paint program. This brings up the real issue.

Several good clip art collections are available at cheaper prices, or free from user groups and bulletin boards. You can purchase a glue stick and plain postcards in stores that sell stationery products. So you can make your own postcards easily without investing in Postcards. Postcard's value comes down to the quality of its clip art (good) and the amount of it you are getting (not so good).

Postcards is the answer to what is known in marketing as The Gift Situation. It might well make an amusing gift for an only slightly artsy-craftsy Mac maniac who probably doesn't have the time to search the world for a glue stick and whose clip art files are bound to be in need of updating. The Postcards package seems almost guaranteed to inspire experimentation, resulting in otherwise unlikely homemade postcards. —Keith McCandless

See *Where to Buy* for contact information.

Has your artsy-craftsy side been losing out to your high-tech habit? Activision's Postcards can have you cutting and pasting with real scissors (yours) and something like real paste (theirs) as you put hands-on finishing touches to clip-art postcards you've digitally slapped together with your Mac. The process is as simple as using your own paint program, so even if you're not much of an artist, you can still make your own funny cards with ease.

The Postcards kit includes one disk containing a clip art collection, 20 blank postcards, and a tube of glue stick. The clip art disk is indexed on a reference card that's included, so you can choose quickly among background scenes, structures, messages and captions, objects, food, people, animals, and vehicles. There are also two template outlines, for the front and the back, in which you can paste your





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B2-005

Getting Your Books in Order

Pro-Cite for the Macintosh 1.3

Bibliographic management system. **Pros:** Creates fully formatted bibliographies from raw database records; comes with style sheet—like files for many standard bibliographic formats; lets you create bibliographic style sheets specifying nearly every conceivable formatting detail; can share files with PC version. **Cons:** Hopelessly disorganized manual; program doesn't support subscripts and superscripts; poor page-formatting abilities. **List price:** \$395. **Company:** Personal Bibliographic Software. **Requires:** 512KE; System 4.1 or higher; two floppy disks or hard disk recommended.

In this era of the computerized grammar-and-spelling checker, thesaurus, and the set-it-and-forget-it footnote, one of the last manual chores left for the writer is the much-dreaded bibliography. FullWrite Professional has a bibliography command, but it's limited to the simplest tasks. And Professional Bibliographic System (see *Reviews*, *Macworld*, January 1987), though good as far as it goes, doesn't go nearly far enough for most serious writers. But they need lament no longer, for Personal Bibliographic Software has completely revamped Professional Bibliographic System to produce Pro-Cite, a unique and powerful bibliographic database manager and bibliography generator.

At the core of Pro-Cite is a bibliographic database with 20 predefined work-

forms. You can record each citation in a workform appropriate to the item being recorded: journal or newspaper article, book, recording, letter, map, musical score, and so on. For media not anticipated by Pro-Cite (such as patents or CD ROM), you can custom-design up to six additional workforms. And you can easily change the workform of a record, for example, from Journal-Short Form to Journal-Long Form or Newspaper, at any time.

Each workform contains a subset of Pro-Cite's 45 field types; these include everything from author (of several types), title (article or book), and publication date, to notes, abstracts, and index words. Fields are of variable length and accept up to 32,000 different characters. Only three—Author, Date, and Index—require special formatting. Unfortunately, Pro-Cite does not check these fields for valid input; it's up to you to remember the proper format (each of the three fields has a different one) and enter the information correctly.

Data entry is simply a matter of typing and tabbing to the next field within the scrolling Pro-Cite database window. User-created *authority lists*—lists of often-used author names, journal titles, index words, and the like—help make data entry easier and reduce input errors. Authority lists, if properly formatted, also function as Microsoft Word-type glossaries; you enter symbols, numbers, or abbreviations in the database and Pro-Cite substitutes the appropriate unabridged terms in any bibliography constructed from that database. You can merge selected records or whole databases. In addition, Pro-Cite quickly locates duplicate records within a database and easily exports records to other database programs.



Sorting, Selecting, Compiling

Pro-Cite has the ability to select, sort, and compile finished bibliographies in almost any imaginable format. Its sophisticated search function can select records using global scans for simple text strings (including wild cards) and Boolean operators (AND, OR, NOT, and so on) for complex sorts. Or you can select citations manually, one by one. If standard alphanumeric order does not meet your needs, Pro-Cite can perform single- or multilevel sorts using up to six different fields to create bibliographies organized, for example, by author, journal name, or index word or phrase.

Finally, from the selected and sorted entries, Pro-Cite creates a fully formatted bibliography. The order of each entry's elements and the punctuation between them is determined by predefined style sheet-like files covering most major bibliographic formats, including those of the American National Standards Institute, *The Chicago Manual of Style*, the *Index Medicus*, and the American Institute of Physics. Should your article be rejected by one journal, you need only choose a different punctuation file to completely reformat the bibliography for your next submission.

You can modify existing punctuation files, or create files of your own in Pro-Cite's Format Description Language. Style

(continues)

Computerized Bibliography

Pro-Cite takes data, such as the record shown here, from its bibliographic database and constructs finished bibliographies in any format.

The screenshot shows the Pro-Cite software window titled "MedSample". It has a menu bar with "File", "Edit", "Font", "Style", "Search", "Bibliography", and "Database". Below the menu bar are buttons: "Update", "Cancel", "PreuSel", "Prev", "Next", and "NextSel". The main area displays a bibliographic record with the following fields:

Auth	David, D./Caplain, R./Demortier, G.
Titl	Characterization of surfaces by nuclear microanalysis and associated techniques
Jrnl	J. Microsc. Spectrosc. Electron.
Date	1987
VolID	12
IsID	4
Loc	353-67
ISSN	0395-9279
Note	
Abst	A review with 19 refs. The principles of nuclear reactin analysis and associated techniques are described, with typical applicaions. These

At the bottom, it shows "Journal, Short Form" and "Record Number: 80". There is a checkbox labeled "Selected" which is checked, and a page indicator "16/20".



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formatting on a field-by-field basis, such as designating italics for journal title and boldface for volume number, can be set in the punctuation file or as a formatting option within the program. Pro-Cite does not, however, support subscripts and superscripts. You can preview completed bibliographies within the program and then print them. But Pro-Cite's page-formatting capabilities are rudimentary at best; you'll obtain much better results by exporting the finished bibliography to another word processor as a text-only file or as a MacWrite 4.5 file (Microsoft Word format is not available).

All This and More

And there's more to Pro-Cite—much more. The program's In-text function, for example, can read a text-only version of a finished article, create a bibliography of citations in the article, and if you wish, change the citations in the article to sequential numbers corresponding to the numbered entries in the bibliography. Bibliographic formatting options include almost every detail in the formatting of author names: the program can even convert first and middle names to initials, replace long lists of secondary authors to *et al.*, and reverse first and last names for some or all authors. Pro-Cite can share database and punctuation files and authority lists with the MS-DOS version of the program. Soon-to-be-released translation utilities, called Biblio-Links, will be able to convert references downloaded from BRS, DIALOG, MEDLARS, and NOTIS into Pro-Cite formats. And many of Pro-Cite's sorting and formatting routines run in the background under MultiFinder.

A major item for criticism is Pro-Cite's disorganized, 600-page manual, which fails to explain adequately the program's overwhelming number of features and options. The index is no help either. If you regularly write papers for scholarly journals, churn out bibliographies of one sort or another, or need to track and print information about collections of almost any kind, Pro-Cite has no peer. But be forewarned: you will have to read all 600 pages of the manual, many of them more than once, to fully tap Pro-Cite's power and versatility.

—Robert C. Eckhardt

See *Where to Buy* for contact information.

Hard Copy for HyperCard

Reports 1.1

HyperCard report program. *Pros:* Extensive select and sort capabilities; layout tools are adequate and easy to use. *Cons:* Limited mail merge and word processing capabilities; best suited for forms-oriented reports. **Company:** Activision (distributed by Mediagenic). **List price:** \$99.95. **Requires:** 1MB.



HyperCard lets you store information elegantly, but its reporting capabilities are crude. Restricted to printing in rows or columns, by card or stack, HyperCard limits the extent to which you can analyze or print data, particularly if you're no pro at HyperTalk. Reports extends HyperCard's meager database and report features. You can sort and select data, preview reports, and print them with graphics and total fields. For complex reports, the program includes a script editor in addition to several script templates.

Designing a Layout

Reports contains two stacks: Reports, which creates a layout, and ReportCard, which lets you select and print a report (see "ReportCard").

To create a report you enter the Reports editor from the ReportCard (or from the desktop), selecting the stack and background that contain the field names to be used in the layout.

The report form consists of five separate sections: the header, footer, detail, total, and break sections. You can use any of

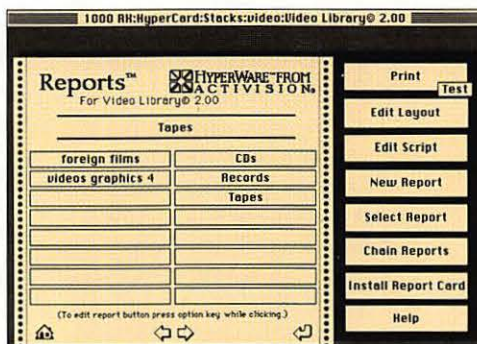
Reports' drawing or field tools in these sections. The header and footer are similar to those in most word processing programs, only instead of icons, you use global variables to handle pagination and date-stamping tasks. The detail section contains the data to be printed from the stack. The break section, with optional page advance, denotes a change in data (such as a month) or department. In creating a report using Edward Schenk's and D. L. Knudson's Video Library, I inserted a break section to visually separate the categories of movies and to give the total number of viewing hours in each category. The total section appears only at the end of the report. I used this information to tally numerical data for the entire report.

You design a report using drawing tools, text information, and graphics fields. The layout form for Reports incorporates many familiar tools (selection arrow, line, rectangle, and text tools). Line width ranges from 1 to 4 pixels. You can group and align objects using a grid or commands, and you can place objects behind or in front of each other. These commands allow you to superimpose text over graphics and set off information with underlining or column rules.

The text information consists of two text tools having different functions: text fields serve as labels; information fields display card data. Information fields have the same names as their stack field counterparts. You can have them show a value, a total, or an average. You can also use fields from more than one background. The Group and Align commands make it simple to position fields, but the object handles appear only when a field is selected. So it's easy to overlap fields, thereby obscuring the letters of one field with another. Merge letters are even more of a problem. If you leave too little space, a scrolling field may overlap the field below it.

To enhance a report with graphics, you have a choice of pasting an image into the layout via the Clipboard, or pasting an image from a stack using a graphics field. Unlike an information field, however, a graphics field does not automatically import data from the card to the report. You have to write a script that includes the image coordinates or that selects the entire card. If you size the graphics field smaller than your largest graphic, Reports reduces

(continues)



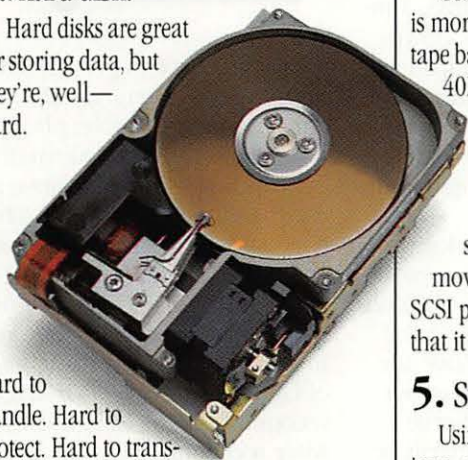
ReportCard

The ReportCard displays up to 16 reports. If you don't use a report regularly, you can replace it with another, or change its order in the list. A test-print feature lets you print or preview a specified number of cards.

7 Reasons Why Tecmar Tape Backup is Vital if You Own a Mac Hard Disk.

1. Why do you think they call it a hard disk?

Hard disks are great for storing data, but they're, well—hard.



Hard to handle. Hard to protect. Hard to transport data and software. You get the picture.

Tecmar's QT-Mac40™ makes owning a hard disk easy. This 40MB tape drive protects your data from human and mechanical failure; lets you remove, yet save, files from your hard disk; lets you send large amounts of data across country overnight; and even organizes all files under an easy-to-use, menu-driven format. That's a hard disk management system.

2. More than Apple® compatibility—interchangeability.

Apple selected the 40MB QIC100 tape format using DC2000-size cartridges for its own tape system, so to be compatible you must have a tape backup system capable of reading and writing in this format.

The QT-Mac40 can. In fact, the QT-Mac40 is so compatible with Apple's own tape system that you can use a QT-Mac40 to write to a tape, put the tape in an Apple system and restore the data to a hard disk, and vice-versa.



3. Faster than a speeding Apple.

Compatible, but better! The QT-Mac40 is more than twice the speed of Apple's tape backup. So, you can back up an entire 40MB hard disk in just 16 minutes—it takes 40 minutes with Apple.

4. Portability for sharing.

QT-Mac40's compact, free-standing design makes it easy to move from Mac to Mac or to a chain of SCSI peripherals for sharing. It's so small that it even fits in most briefcases.

5. Superior software.

Using the Mac's familiar, easy-to-use icon-oriented software interface, the QT-Mac40 requires no special training.

And, the QT-Mac40 has many software features that simply aren't available with any other unit, such as our exclusive PowerTag™ software that lets you selectively tag only the files that have changed for backup. And a background backup mode that lets you back up while using the Mac.

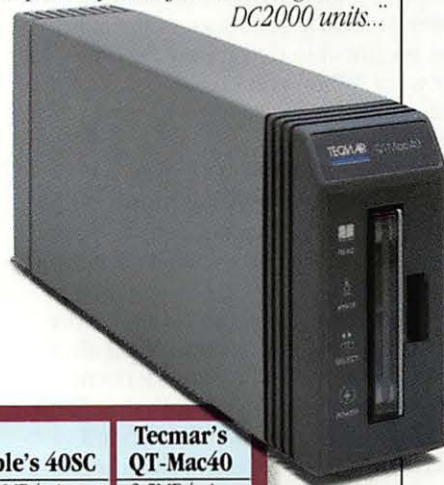
6. Experience makes the difference.

As the leading tape backup supplier for all personal computers, with over 100,000 units in the field, no one—not even Apple—can match our experience and engineering know-

how. Maybe that's why we're able to give you a two-year warranty. And, if you have a problem in the first six months of ownership, we guarantee a replacement within 48 hours.

7. Experts agree.

Ric Ford—MacWEEK: "Our experience with the QT-Mac40 was quite positive. The hardware is solid, attractive and compact. It proved fastest among the DC2000 units..."



Tecmar's QT-Mac40 vs. Apple's 40SC™

Speed	1MB/min.	Tecmar's QT-Mac40
Portable	No	2.5MB/min.
Warranty	90 days	2 years
Experience in Tape Backup	None	4 years
Price	\$1,495	\$1,395

Apple's 40SC

Tecmar's QT-Mac40

John Rizzo—MacintoshToday: "I recommend the Tecmar QT-Mac40 for its speed, portability, quality of construction and software interface."

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that graphic to fit the field. Images smaller than the field are centered within the field.

Selecting, Sorting, and Scripting

Reports performs up to 16 selections and 5 sorts. A dialog box lists the information fields for the Sort and Select operations. You refine the criteria by specifying field components (Character, Word, Item, or Line) and by setting comparison operators (such as Contains, Excludes, Greater Than, Less, or Equal). After choosing a comparison operator, data type (Text, Number, Date) and relationship (And, Or), a list of statements appears in a window with your Select or Sort criteria. You can add, edit, or delete these statements, but not copy or move them, which is annoying at times, since the sequence of the statements is critical in extracting the data you really want. When you save the report, the Sort and Select criteria become part of the report layout.

A Script Editor allows experienced HyperCard users to prepare more complex reports. The Scripts menu includes script templates with handlers that request information before a report, initiate an action after a report, carry out an action before printing a section, or update a card after printing the report. The Statements menu lists frequently used HyperTalk statements, such as Add, Answer, Ask. Predefined globals perform useful chores such as keeping track of the report path name, or supplying the background name where the fields in the layout appear. You can also edit the script from ReportCard without having to open the layout program, a nice shortcut if you get an error message while previewing a report.

The Printout

Before printing a report, it's wise to preview or test print the report layout with Preview. The preview screen has a magnifying glass, scroll bars, and a size box (available in version 1.2). To make printing more efficient, Reports allows you to chain reports. Activision also provides pre-designed reports for use with its other HyperCard application, Focal Point.

Although you do not need to write a script to produce a report, it doesn't take long to advance from simple to complex layouts that do require scripting. But basically, you'll find Reports to be a good, utilitarian tool and a welcome relief from the frustrations of extracting and printing data from stacks. —Janet McCandless

See *Where to Buy* for contact information.

Call Me

MacNet 1.0

Communications network. **Pros:** Easy to use; excellent electronic mail; free stock market information; automatic connect feature; low connect charges. **Cons:** Awkward public message system. **Company:** Connect. **List price:** \$49.95. **Requires:** 512KE; 800K external drive or hard drive; modem.



Bulletin board systems (BBSs) are great places to get advice, download programs, and participate in discussions. But a BBS or telecommunications network is only as useful as its user interface. After all, what good is the information on a network if you can't figure out where to find it?

Enter MacNet, which lets you log on to and navigate through a network in typical Mac fashion. To find bulletin boards and information, you click through hierarchical folders and icons (see "Neither Snow, nor Rain"). As a result, MacNet is much easier to use than networks like CompuServe, GENie, and Dow Jones, which primarily require text commands to navigate the information network.

Dialing In and Moving About

MacNet consists of the network itself, plus the software to log on to and navigate that network. Unlike general-purpose software like MicroPhone, FreeTerm, or Red Ryder, MacNet software was developed specifically for the MacNet network. All communications protocols are automatically set by the MacNet software; the only



things you have to provide are your modem's speed (currently 1200 or 2400 baud) and your area's MacNet phone number.

MacNet's electronic mail feature is outstanding—more intuitive and easier to use than Desktop Express. The form for messages comes complete with "to", "cc", and "subject" headers (see "This Looks Familiar"). Mail can include files, programs, or Glue documents created with ImageSaver. MacNet has a built-in version of Glue's Viewer, so your Mac automatically recognizes those ImageSaver documents. After receiving mail, you can save it to disk; or you can print mail while you're online or after you've disconnected from MacNet.

Bulletin Alert

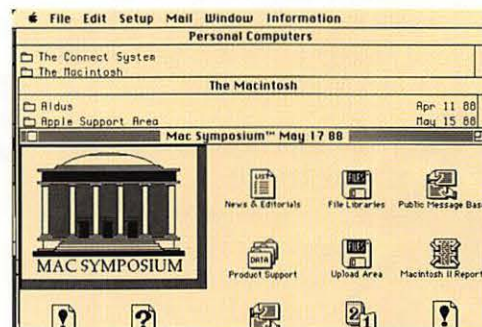
Bulletin boards are an important part of any network, and MacNet has many. The Apple Support Forum provides Apple System software upgrades, development software, product specifications, and a database of helpful Mac documents; there's even a place called AskApple, where you can ask Apple questions. Some vendors, like Aldus, offer hotline product support on MacNet.

There are also two medical databases: bioMedicus and medLaw. You search for database information by keyword, date, or table of contents.

Among the services in the Mac Symposium are file libraries, a user-group forum, a public-message forum, and third-party-vendor product information. Because MacNet connection charges are lower than those of other information services, downloading shareware and public domain software is less expensive.

MacNet provides free 15-minute delayed quotes on stocks, futures, and op-

(continues)



Neither Snow, nor Rain

Unlike most telecommunications networks, you navigate through MacNet services by clicking on hierarchical icons and folders.

Not just another pretty face



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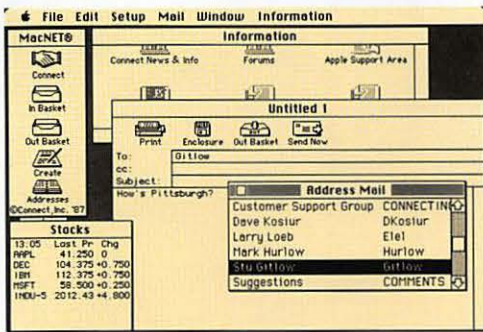
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S I G M A D E S I G N S



This Looks Familiar

Macnet's E-mail system lets you create your own address book for frequent E-mail-recipient user IDs. You don't have to be connected to compose messages.

tions. With the Auto Connect feature, you can configure the Mac to call the network, log on, receive and send mail, update stock information, and log off at specific times and days of the week. Auto Connect does work in MultiFinder's background.

The only thing I'd like to see improved is MacNet's public-message system. Posting a message on any MacNet public bulletin board is not intuitive. Although the public and private (E-mail) message forms are identical, you don't use the "to" or "cc" lines; you must indicate the subject on the "subject" line. Then, you can't post a public message with a keyboard command—only from a menu.

To read public messages, you must open them individually. This procedure takes much more time than scrolling through messages on other BBS systems. You can't download a whole set of public messages because you must select each message to save. It would also be nice if messages could be linked to one another in a threadlike format. As it now stands, you can either rely on the subject header to follow a thread or you can perform a keyword search.

Number, Please

These problems, however, don't undermine the good features MacNet offers: a user interface that makes browsing through information a breeze, and an excellent mail system. Connect charges are reasonable: \$8 per hour during peak hours (7 a.m. to 7 p.m.), and \$4 per hour during nonpeak hours. If you're a telecommunications novice, definitely check out MacNet. Even if you're an old hand, do the same; you'll be impressed.—Brita Meng

See *Where to Buy* for contact information.

Tracing Your Roots

MacGene 2.85

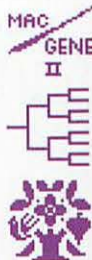
Genealogy program. **Pros:** Wide variety of features; supports user-defined fields. **Cons:** Many features poorly implemented; can't relabel fields; poorly designed charts; misleading descendant chart data. **Company:** Applied Ideas. **List price:** Version 2.9 \$145. **Requires:** 512K; hard disk recommended.

Family Heritage File 1.5

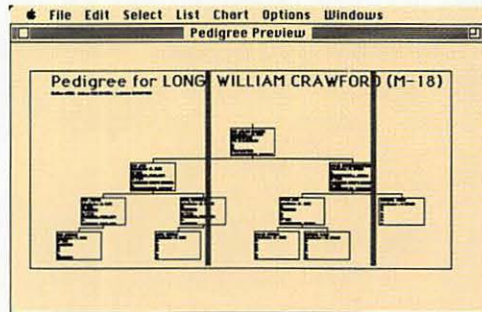
Genealogy program. **Pros:** Easy to learn and use; good note file implementation; excellent help for researching and organizing information; professional output. **Cons:** No Cut and Paste; lacks descendant chart; lacks user-definable fields. **Company:** Starcom Microsystems. **List price:** \$149. **Requires:** 512K.

Family Roots 1.3

Genealogy program. **Pros:** Highly versatile and customizable; supports macros. **Cons:** Hard to learn and use; some confusing commands. **Company:** Quinsept. **List price:** Version 1.4 \$117.50. **Requires:** 512K.



MacGene, Family Heritage File, and Family Roots are geared toward people who treat genealogy as an ongoing research effort, rather than a weekend project. For this review, three people—an experienced genealogist/novice Macintosh user, an intermediate genealogist/intermediate Macintosh user, and a novice genealogist/experienced Macintosh user—tested the programs. We wanted to see if all three would agree on which program to buy.



A Sprawling Tree

Although MacGene creates a familiar MacDraw-type chart, it doesn't present a standard one-page pedigree chart. A standard pedigree chart also flows from left to right rather than from top to bottom.

MacGene

MacGene offers a wide variety of features, some of which are very useful. But unfortunately, most of them are poorly implemented. For instance, the program lets you define 12 fields, so you can choose the types of data that you want to record. But unlike standard database programs, you cannot change the default labels. Thus, the first field is always labeled Field #1, the second, Field #2, and so on. MacGene does provide a "hint" utility (really a notepad) where you can record new field labels, but this information cannot be printed on any record or chart.

MacGene also provides three note fields, but limits them to 40 characters each. The program tries to get around this limit by including a field in each person's primary information file to link it to a separate document, which could include more detailed notes. Although this method works, many research notes warrant inclusion in the primary record.

Most of MacGene's problems consisted of minor annoyances, but we did find two serious flaws. First, the program's date field format does not accept an entry of "bef 1770" or "aft 1820." Customer support personnel suggested using ~1769 or ~1821, allowable entries for "approximate" dates. Data fields, however, should support complete, accurate entry of data. After all, a good deal of effort is required to determine the dates, and they could be important for conducting future research.

The second major problem occurs in the descendant and pedigree charts. Although the charts should be informative and useful features, they are poorly implemented. The descendant chart lists up to eight generations of descendants from a specified individual. But because the chart lists the offspring in each generation in reverse order of actual birth, it can be very misleading. The pedigree chart is presented in a nonstandard format that does not print on a single, letter-size page. You have to tape the pages together and then fold them to fit into a binder, thus creating a cumbersome document.

Family Heritage File

Family Heritage File is a licensed version of the Personal Ancestral File, a genealogy program and standard established by the Church of Latter-Day Saints. Although Family Heritage File does not support the

(continues)

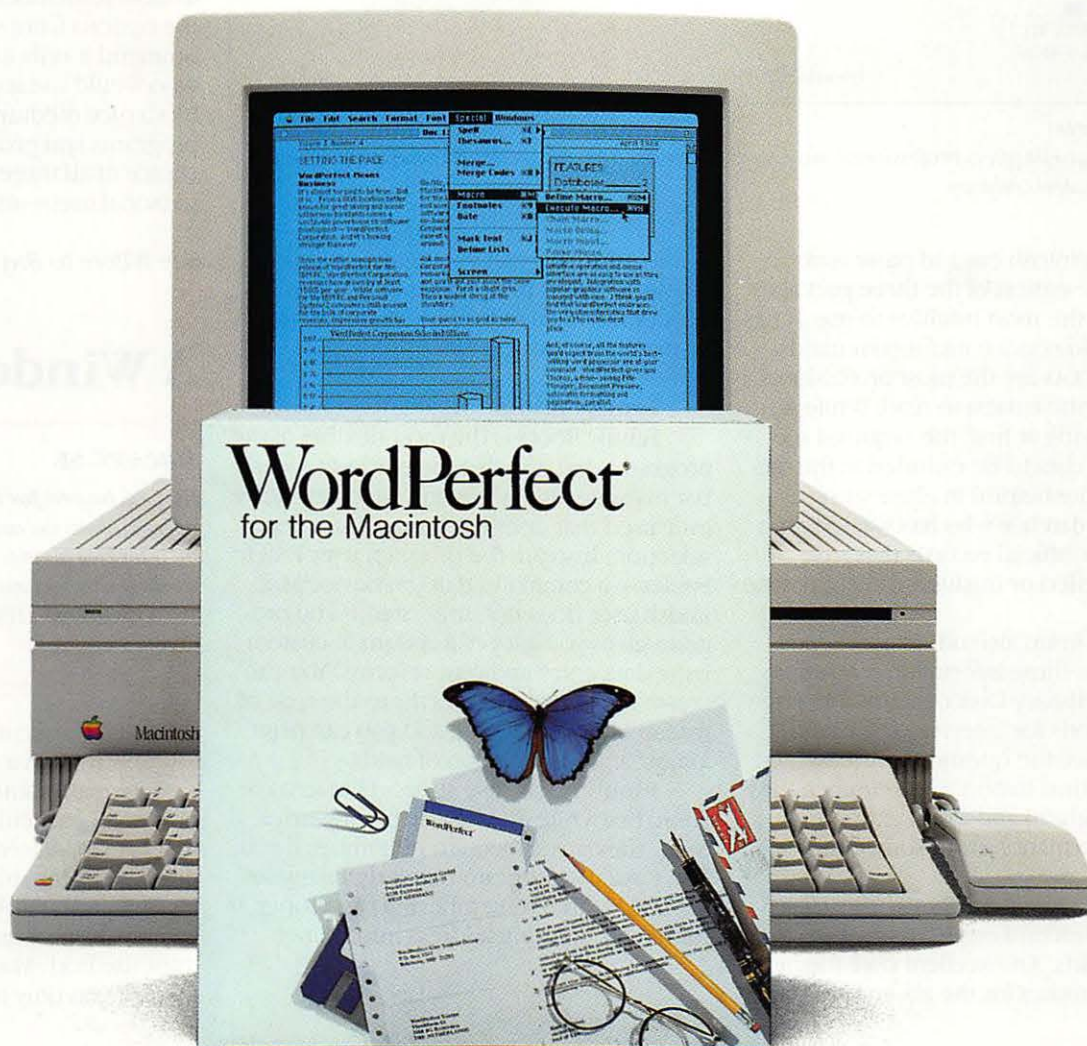
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HUSBAND FINIS EWING MC DONALD LONG-0016				
Born:	31 OCT 1836	Place:	BRECKINRIDGE CO., KENTUCKY	
Chr.:		Place:		
Marr:	31 OCT 1867	Place:	LOUISVILLE, KENTUCKY	
Died:	29 JAN 1923	Place:	LOUISVILLE, KENTUCKY	
Bur.:	1 FEB 1923	Place:	PLOT R-36-S 1/2, CAVE HILL CEM., LOUISVILLE, KENTUCKY	
Father: WILLIAM CRAWFORD LONG REV.-0035				
Mother: ELIZABETH (BETSY) ANN CRUTCHER-0036				
Other Wives:				
=====				
WIFE MARY ROONEY-0017				
Born:	22 JAN 1835	Place:	LOUISVILLE, KENTUCKY	
Chr.:		Place:		
Died:	3 OCT 1910	Place:	SUE RUTER SMITHS, 7TH STREET HOUSE, LOUISVILLE, KENTUCKY	
Bur.:	5 OCT 1910	Place:	CAVE HILL CEM., LOUISVILLE, KENTUCKY	
Father: PETER ROONEY-0044				
Mother: SALLIE AHULL-0045				
Other Husbands:				
=====				
SEX	CHILDREN	LIST EACH CHILD (LIVING OR DEAD)		
M/F		IN ORDER OF BIRTH		
=====				
1.	Name: WILLIAM COURTNEY LONG-0018	Spouse:		
---	Born: 21 AUG 1868	Place:	LOUISVILLE, KENTUCKY	
M	Marr:	Place:		
	Died: DEC 1894	Place:	LOUISVILLE, KENTUCKY	
=====				
Name and Address:				
JACK & JUDY LONG				
226 EDELEN AVENUE #11				
LOS GATOS, CALIFORNIA				
95030				
Phone: 408-354-9544				

Family Reports

Family Heritage File offers professional, easy-to-read reports. This report details one family group—husband, wife, and children.

standard Macintosh cut and paste functions, it is the easiest of the three packages to learn and the most intuitive to use. It has very clear and concise menu commands, and its printouts are the most professional looking and the easiest to read. While it seems annoying at first, the required second entry of data to be included in the dictionary is quite helpful in eliminating errors. Any researcher who has wasted time searching for official records that have been misspelled or misfiled will appreciate this feature.

The program also offers excellent help in researching information. A Supplemental Life History Disk contains a 15-page list of questions for interviewing a family member. Since the questions were written by a professional historical researcher, they are very insightful and aid in extracting accurate information from someone's memories.

On the down side, Family Heritage File lacks a descendant chart and user-definable fields. An excellent note file partially compensates for the absence of these

fields—not only can you enter unlimited amounts of text in the file, but you can also select individual notes for printing in the primary information file.

Family Roots

Family Roots is the most flexible of the programs, but it is also the hardest to learn. For instance, this is the only program we've ever used that does not have a Quit menu selection. Instead, the program uses Exit to Finder—a command that the novice Macintosh user does not understand. The program gives you a lot of freedom in customizing data entry and report forms. You can create forms that are specific to the type of research you are doing, and you can print almost any combination of fields.

Family Roots also supports macro creation, but while macros can be powerful tools, they are difficult to remember if you don't use the program regularly. Likewise, we had trouble remembering the proper format for entering address information.

The address is entered into a single field and must be coded to keep the street addresses from printing with the city/state information on charts and lists.

Although the manual is thorough, it's somewhat intimidating, requiring more than a beginner's understanding of both genealogy and computer terminology. Also, several of Family Roots' commands are unclear or ambiguous. For example, when you want to delete all the data in an individual's information file, you select the Reinitialize command. Since "initialize" in Mac terminology generally reformats an entire disk, all three testers were hesitant to use the command.

Each of the programs can handle unusual entries—such as for adopted children (who can have two sets of parents), children of unwed parents (an "unjoined" family structure), or name changes—as long as you use a little logical creativity. MacGene, however, contains too many flaws for us to recommend it. Family Roots is highly versatile, but because we had trouble remembering how to use many of the options from session to session, we recommend it only to full-time researchers who would use it daily. Family Heritage File hits a nice medium between the other two programs and proved to be the unanimous choice of all three test participants for their personal use.—*Jack Long*

See *Where to Buy* for contact information.

A Window on DOS

Mac+PC SE

IBM PC board for the SE. **Pros:** Good engineering; runs the major MS-DOS programs; helpful interface utilities; good technical support.

Cons: Weak documentation. **Company:** Perfectek. **List price:** \$1195. **Requires:** Mac SE, two disk drives.



Despite its advantages, the Mac lives in a computing environment still dominated by IBM PCs. Many offices, in particular, have heavy investments in PC-based software and need to preserve compatibility while integrating Macs. The Mac+PC SE board is a very slick solution to problems faced by people who must use both Mac and MS-DOS applications. If you only need to run a PC program

(continues)

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occasionally, this solution is more expensive than keeping a PC clone on standby; however, it's very effective for users who must frequently switch between a PC and a Macintosh.

Packing a PC

Because Mac+PC SE is based on PerfectTek's MS-DOS board for the Mac Plus, the engineering is well debugged and the board has a clean layout with no rework. The Mac+PC SE features an 8-MHz NEC upgrade for the 8086, resulting in computational performance on PC programs that's slightly better than that of a Turbo XT. The board has its own PC-style parallel port and serial port, which are accessible through the cut-out slot on the back of the SE.

The board also includes 512K of RAM; it is upgradable to 640K, but 512K is sufficient for most DOS applications. Because Mac+PC SE doesn't require you to partition any Macintosh main memory, you can run MultiFinder in the SE's 1 megabyte, treating your DOS work as just another switchable application.

Making Itself Useful

The Mac+PC SE comes with some very helpful interface utilities. One set allows you to transfer data and programs from PC floppies using the transfer utility and the provided null-modem cable. The

utility software creates a logical DOS format on 3½-inch Mac disks, so you can use them in a Mac that is running the Mac+PC SE. Thus, you can run DOS programs using only the drives in your Mac (other DOS boards require you to use a 5¼-inch drive like the DaynaFile).

After setting up the disks, you can transfer the applications and DOS to a partitioned area of your hard disk, using the DOS utility FDisk. (You must have your own copy of DOS, preferably version 3.2 or higher.) The partition makes your system behave as if it had two smaller hard disks, one loaded with DOS and PC applications and the other with Mac files and programs. When you double-click the Mac+PC SE application icon on the Mac side of the fence, the screen turns into a DOS window with a limited Mac menu at the top (see "Eureka?!"). When you quit, you land back in the Macintosh world.

The menu on the DOS side lets you cut, copy, and paste in traditional Mac style; use DAS; and set whole-screen fonts and point sizes. (In practice, anything besides 9-point Monaco leads to most DOS programs spilling off the screen.) The Graphics selections enable you to set gray-scale graphics in selected applications, and the Special menu lets you solve some DOS-specific problems with the Mac keyboard (for example, the \mathbb{A} key can be set to correspond to Alt on the PC keyboard so

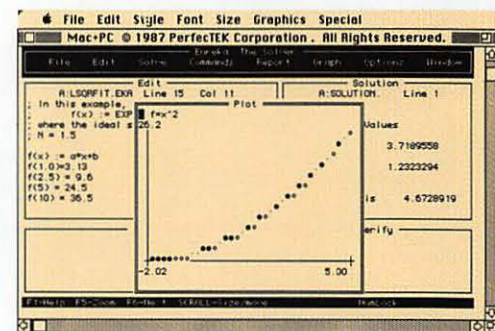
you can reboot with Ctrl-Alt-Delete). And, although major MS-DOS programs such as Lotus 1-2-3 and WordStar run flawlessly, others such as Flight Simulator and Side-Kick do not work properly due to keyboard, graphics, and memory-allocation considerations.

The skimpy manual offers little help to Mac-mostly users expanding into DOS applications, but phone support is cheerful, prompt, and technically competent.

Why?

One advantage of using the Mac+PC SE instead of switching between the Mac and a PC clone is that you can easily transfer files from the PC partition to the Mac partition and vice versa. For instance, you can receive a dBase file in DOS mode over the serial port, modify it in PC dBase, and then pop it up in the Mac directory for use in a Mac database.

Although most Mac programs make provision for transforming files into their drab, PC-readable equivalents, the value of the Mac+PC SE lies elsewhere. It allows you to use a Mac in offices where vertical-



Eureka?!

This is the DOS version of Borland's Eureka, running on a Mac SE equipped with Mac+PC SE. This screen was generated during a benchmark run—the board is more valuable on specialized applications for which no Mac equivalent exists (yet).

market applications (for example, real estate or dental) are still PC-only. Mac+PC SE also gives the SE an entry into the many businesses that require any newly acquired computers to be compatible with certain standardized pieces of software. If you face these situations, or specifically need portability as well as PC access, the PerfectTek Mac+PC SE is a good value.

—Charles Seiter

See *Where to Buy* for contact information.



H21

16

Worksheet1

	A	B	C	D	E	F
1	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
2	\$56.00	\$6,584.00	\$65.00	\$56.00	\$8.00	\$98,416.00
3	\$51,651.00	\$65.00	\$465.00	\$6,512.00	\$65.00	\$61.00
4	\$651.00	\$654.00	\$321.00	\$6.00	\$84.00	\$6,265.00
5	\$9,684.00	\$654.00	\$6.00	\$651.00	\$6.00	\$636.00
6	\$6,565.00	\$65.00	\$23.00	\$6.00	\$5,198.00	\$6,548.00
7	\$5.00	\$9.00	\$505.00	\$85,146.00	\$1.00	\$1.00
8	\$6.00	\$2.00	\$23.00	\$321.00	\$321.00	\$6,941.00
9	\$654.00	\$85.00	\$5,643.00	\$682.00	\$5.00	\$65.00
10	\$6.00	\$1.00	\$595.00	\$6.00	\$63.00	\$846.00
11	\$8,984.00	\$8.00	\$2,059.00	\$1.00	\$51.00	\$51.00
12	\$65.00	\$5.00	\$35.00	\$654.00	\$635.00	\$9.00
13	\$65.00	\$1,549.00	\$7.00	\$65.00	\$158.00	\$51.00
14	\$356.00	\$5.00	\$9,512.00	\$1.00	\$1.00	\$9.00
15	\$654.00	\$1.00	\$692.00	\$651.00	\$54.00	\$59.00
16	\$99.00	\$6,549.00	\$635.00	\$5,618.00	\$65.00	\$8.00
17	\$0.00	\$25.00	\$92.00	\$654.00	\$50,196.00	\$651.00
18	\$0.00	\$1.00	\$5.00	\$51.00	\$516.00	\$98.00
19	\$0.00	\$6.00	\$5.00	\$51.00	\$51.00	\$51.00
20	\$1.00	\$85.00	\$5.00	\$6,985.00	\$8.00	\$8.00
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Window Shopping

In this new column, I'll look at programs and peripherals that don't qualify for a separate review, but that could nevertheless make a big difference in the convenience, efficiency, and power of your computing. I also hope to save you from the painful experience of shelling out \$49.95 for a DA or utility that is limited, impractical, bug-ridden, or that doesn't perform as advertised. And, finally, because the ease of creating small programs encourages redundancy, I'll try to sort out The Wonder DA from The DA Wonder and help you decide which is best for you.



A 70 Percent Solution

If you want to use HyperCard but don't have enough memory, you have a problem. And, even if you have enough memory to run the program but not enough to run it under MultiFinder, you are probably feeling frustrated because you have to quit your application to access a stack. HyperDA version 1.01 (Symmetry Corporation, \$69) provides a 70 percent solution to these problems. It allows you to access HyperCard stacks through a DA. So your electronic telephone directory or datebook can sit where it belongs: next to the alarm clock or calculator when you're using an application. Using HyperDA, you can browse through stacks and even copy text or graphics from a card and paste it into the application.

The only thing you can't do is alter the stack; hence the missing 30 percent. This can be frustrating. For instance, if a telephone operator gives you a new number, you have to write it on a scrap of paper and remember to type it into HyperCard later. But HyperDA goes a long way toward making HyperCard usable for everyone.

One of HyperDA's best features is the option of displaying the stack in a full screen, just as it would appear in HyperCard, or in a window. The window option

enables you to resize and move the stack around the screen. HyperDA includes the full range of HyperCard navigational tools, including First, Next, Last, and Find. The Find box also accepts most HyperTalk navigational messages, such as "Go to fourth card." Another advantage of HyperDA is that its manual and tutorial are easier to follow than the HyperCard tutorial; so if all you want to do with stacks is browse, HyperDA can shorten your learning time.

HyperDA has one potential problem—it doesn't support all of HyperTalk, HyperCard's programming language. So some browsing functions of some stacks may not work properly. While I haven't experienced difficulties with any of my stacks, Symmetry estimates that 10 to 20 percent of stacks might pose a problem.

Macro Mania

I hate to remind you of this. But just for a minute, sit back and remember the last time you got angry at Excel. Here's mine: I was working on a worksheet where I often had to add new rows, which meant I had to leave the cell I was working on, select the row, choose Insert from the Edit menu, wait for the new row to appear, and then find my way back to where I was before.

I now have a macro that inserts a row under the one I'm working on with one keystroke, and it works without forcing me to move from my cell. It's part of a package of handy macros called 101 Macros for Excel (Micropak International, \$69.95).

A macro enables you to perform a function that would normally require any number of keystrokes, mouse actions, and commands, with one Option-⌘-letter sequence. Although you can create macros yourself, the package takes that complicated and tedious task off your hands. 101 Macros for Excel contains format, align-



ment, and border macros; cursor- and window-control macros; database, charting, and editing macros; and more. There is a macro that allows you to "visit" another part of your worksheet and then return to where you started. There is one to overlay windows. And there is a set of macros that leads you step-by-step through the process of building and accessing a database.

The package has one of the best-organized manuals I've seen. In the outside margin of each page is the name of the macro and the keystroke sequence needed to run it. In the center of the page, short paragraphs explain what the macro does and how it works, and offer suggestions about how to use it to full advantage. The macro instructions are clear and concise, and each one is independent of the others, so you have to read only about those you are interested in. If you use Excel, I guarantee that you'll find things of value here.

Spreadsheet Sleuthing

Making an adventure game out of Excel might seem like trying to jitterbug to Mozart. But Templates of Doom version 1.0

(continues)

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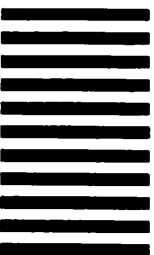
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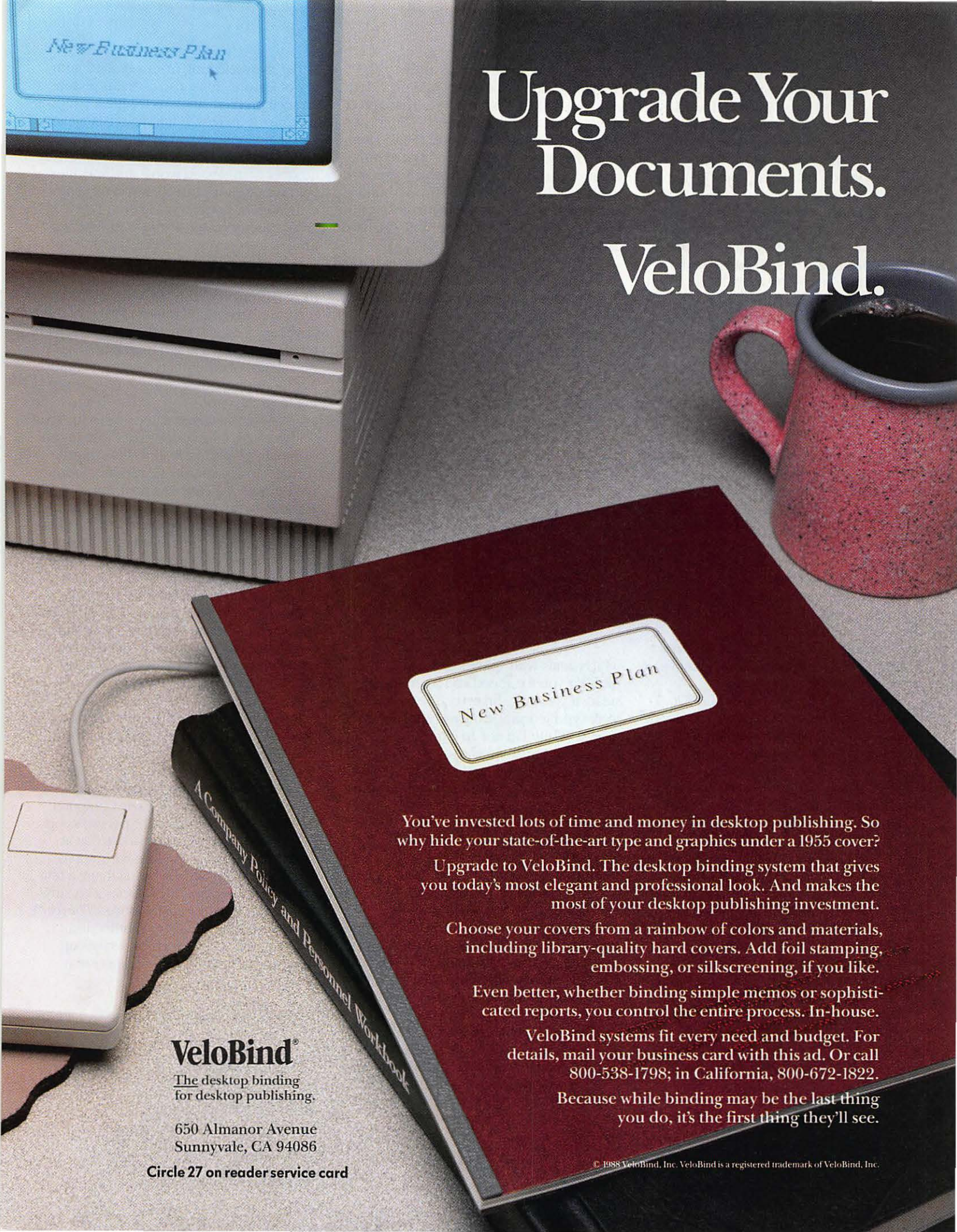
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(Solar Systems Software, \$49.95), an adventure-mystery puzzler that is really an Excel template, is ingenious, witty, and fun. It's the kind of thing you'll plan to work on for a few minutes while taking a break from your spreadsheet and then find yourself still working on it an hour later. But it's tough, and it will probably be frustrating to most beginning—and even many intermediate—Excel users. The program presents you with 24 puzzles of increasing difficulty. Each puzzle is a spreadsheet in which the name of a weapon, location, villain, or other clue is hidden. The clues become visible when you manipulate the spreadsheet in the correct way. For example, you might have to sort certain columns, realign data, delete cells, or extract database information.

Templates of Doom also teaches Excel by providing four levels of assistance. The first two levels furnish hints. The third level tells you how to find the clue by referring you to Excel's help file and sometimes to the manual. For example, if the program tells you to delete certain cells and sort the remaining data in ascending order, the third level will explain where to find information on deleting and sorting. The fourth level of assistance triggers a macro that solves the puzzle for you. But watching Excel run through a macro (even though it does so in steps) is very confusing, so you'll probably use the fourth level only when you've given up and want to move on to the next screen.

Your score is based on the time it takes to discover the clue plus a penalty determined by the difficulty of the puzzle or the level of assistance you have used. The program compares your score for each puzzle against a par score and assigns a designation to your effort ranging from "Outstanding" to "Are you trying?"

Templates of Doom will teach you new Excel tools and functions and give you practice with those you already know. But do not buy it if you are a beginner hoping for a painless method of learning Excel basics—it's simply too hard. For example, to solve one puzzle, you have to guess that you must apply the MID function, an obscure utility that almost no one uses in real life. This is for the Excel aficionado.

Getting the Touch

Using a typing program is one of the best ways to learn to type. The program au-

tomatically flags your errors, times you, pinpoints your weaknesses, and provides exercises to help you improve. That's probably the reason Typing Tutor IV (Simon & Schuster Computer Software, \$54.95) has been one of the top five educational programs for many months. Recently two new packages, Type version 1.0 (Brøderbund Software, \$49.95) and Typing Instructor Encore (Individual Software, \$49.95), have thrown their hats into the ring.

Typing Instructor Encore has two sets of lessons: Learning Key Locations and Building Speed and Accuracy. The first set,



which deals with specific keys, does not monitor you for speed and accuracy. Instead, if you make an error, the word you were typing disappears and you have to re-type it. While I'm not an expert in educational theory, this seems to be a good way to learn. The speed-and-accuracy section offers the traditional approach that flags errors and displays speed and error percentages. After you complete an exercise, you can take a test made up of your mistyped words. Typing Instructor Encore also has a number of standard tests, including a few that cover skills on business and technical materials. Another unique feature of the program is its section on word processing functions such as Cut, Copy, Paste, and Delete. The package also has a video game in which a lobster, which you set to travel at a words-per-minute speed, chases your words as you type.

While Type has only the traditional speed-and-accuracy mode of practice, it offers a wider range of features than most other typing programs. For example, you can specify the letters you want to practice

rather than selecting from a limited number of lessons. Type also contains lessons on such problem areas as frequent patterns and mirror images. When you finish an exercise, not only do you get speed-and-accuracy reports, but the screen displays the number of mistyped words and specifies your weak letters as well. If you do especially well or poorly on a lesson, Type suggests another lesson to move to. After you finish a lesson, you can take a weak-letter drill made up of your frequently mistyped letters. Also, Type offers more graphs than most typing programs do—graphs that measure strength on different rows of the keyboard, on each finger, and on each letter; there's even a graph that shows the prevalence of different types of errors such as misshifting, transposing letters, or typing from the wrong row.

The action game that comes with Type is also more imaginative than those in other typing programs. It shows two hurdle runners in a stadium; one represents your typing speed, the other a goal you specify. If you make an error, your runner trips and slows down. There is even a pretty good sound effect that simulates heavy breathing, so the people next door might wonder who is in the room with you.

I like Type because I like to graph things. If I'm writing a book, I graph how many words I write each day; I graph my sources of income; and my friends accuse me of graphing how many dates I have each month (that's not true). But I'm not sure that graphs or nice video games translate into pedagogic value. For most learners, any of these programs will suffice—buy whatever is on sale.

Cute and Not So Dumb

Thingi (Advanced Gravis Computer Technology, \$7.95) is a poor person's copy holder. It's a 2-by-10-inch paddle that attaches to the top of the Mac with Velcro strips, and from which you can hang a few sheets of paper. Frankly, it looks a bit silly, and its cutesy name (pronounced *Thingee*) bothered me at first. But on reflection I thought, why not? It's cheap, it takes up little space, and it works. —Lawrence Stevens

See *Where to Buy* for contact information.

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For more information and imaging contact the center nearest you.

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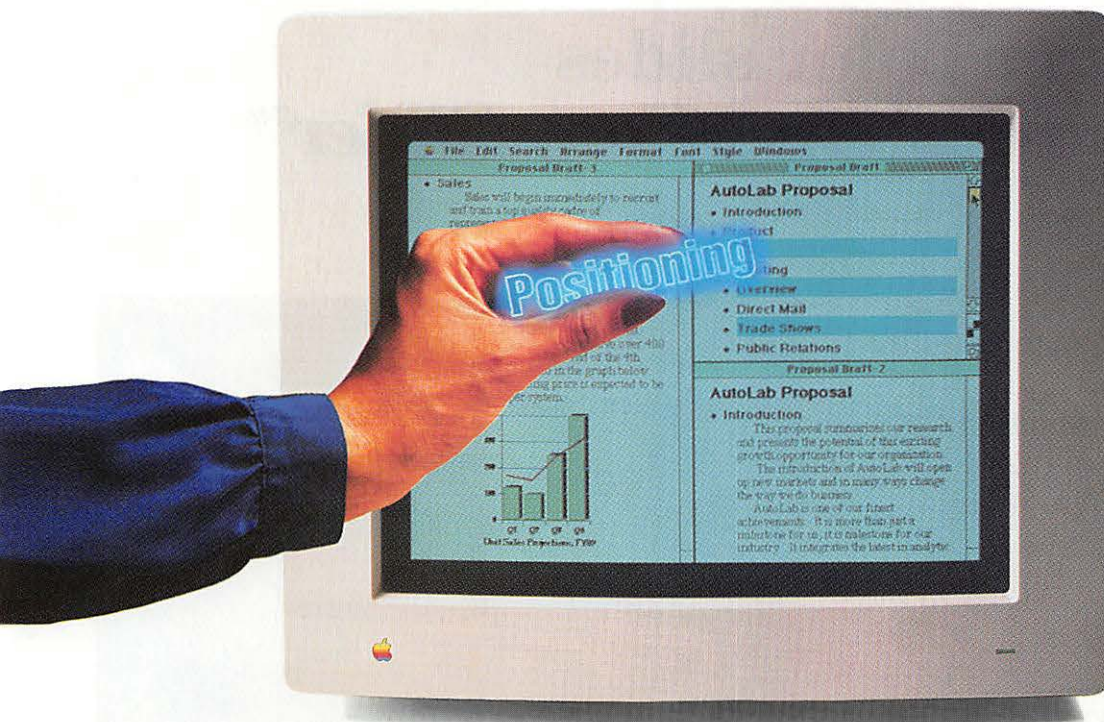


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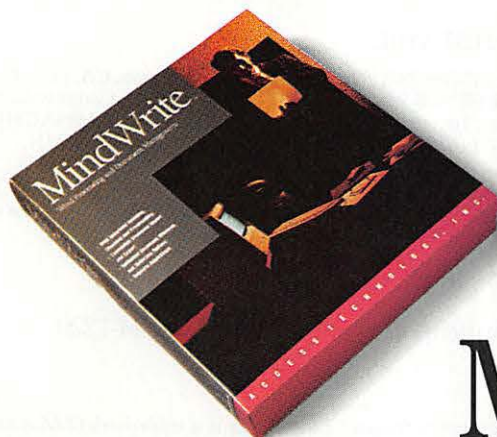
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Mind Over



If you prepare marketing plans, proposals, reports—or, for that matter, any business document—you need a tool that helps take your thoughts logically from concept to completion. Quickly and easily.

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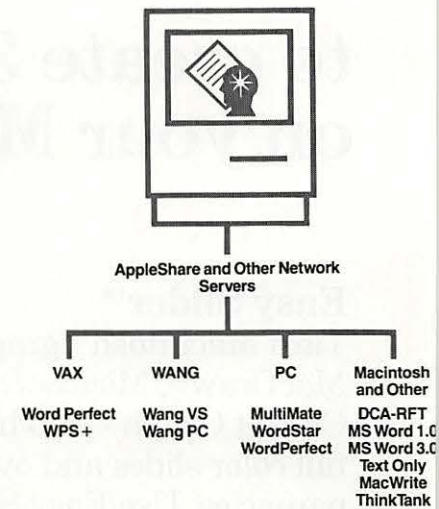
introduce the new MindWrite™ MindWrite 2.0.

Admittedly, since its introduction, MindWrite has defied easy classification. Because for all its advanced word- and document-processing features, it also has the most sophisticated outlining and idea management capabilities available.

Seamlessly integrated in one package.

Basically what MindWrite allows you to do is readily organize ideas and thoughts so you can turn them into clear, insightful documents.

All with a couple of mouse clicks.



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"MindWrite's outstanding feature is its effortless integration of outlining and word processing, an integration that Word, for one, has never dreamt of."

*Ted Silveira
"Out of Your Mind,"
MacUser, February 1988*

To ensure that your work is letter perfect.

MindWrite also directly reads and writes Microsoft® Word and MacWrite™ files and reads ThinkTank™ outlines. And for page layout, MindWrite documents can be imported directly into Aldus PageMaker 3.0®. To

MindWrite by Access

Matter

"For business professionals looking for a word-processor based on outlining, *MindWrite* is both the easiest to learn, and the most powerful product available."

Jim Wolcott
"The *MindWrite* Word Processor, Flexible
Outlining for Organizing Your Ideas,"
MicroTimes, May 1988

help you share documents across a network, *MindWrite* supports AppleShare.*

There's even a version of *MindWrite*, called *MindWrite-Express*,™ designed for those of you whose workgroups use many types of computers, including PCs, VAXs, minicomputers and mainframes in addition to Macintoshes. *MindWrite-Express* reads and writes documents created in MultiMate,™ WordStar,® Wang VS,® DCA-RFT,™ WordPerfect,™ VAX WPS +™ and other standard formats. Which means you can maximize your existing hardware and software investment—and still have people sharing documents.

Now for the part you really won't mind. You can have all the capabilities of *MindWrite* for just \$195.* Or the communications options of *MindWrite-Express* for just \$250.

So to spend less time and effort organizing your thoughts—

Technology

Visit us at MacWorld Boston, Booth #804, Bayside Expo Center August 11–13, 1988.

and documenting the results—call us at (800) 367-4334 and ask for our \$10 *MindWrite* Evaluation Kit with Quick Start Guide. Or write us at Access/*MindWork* Division, 200G Heritage Harbor, Monterey, CA 93940-2483.

800-367-4334

See for yourself how, with *MindWrite*, you can do anything you set your mind to. And in the long run that's all that really matters.

"I find that *MindWrite* allows me to get writing projects done in a third to half the usual time. I should mention that I have MORE but I prefer to use *MindWrite*. It is superior for outlining/writing projects."

Fred H.

"[*MindWrite*] was so easy to learn that I was able to use it in a genuine emergency without ever having really used it before, and I was able to use a lot of its best features immediately."

Bernard Glassman
Vice President, Marketing,
HealthEast, Allentown, PA

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- **MindWrite 2.0 Features**
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 - Wildcard guess.
 - Automatic guess option.
 - Expandable dictionary.
 - Alternate main and document dictionaries.
 - Legal and Medical dictionaries available.
- **Extensive Document Import and Export**
 - Open Microsoft Word, MacWrite, ThinkTank, or Text Only documents directly.
 - Save documents in Microsoft Word, MacWrite, or Text Only format.
 - With the *MindWrite-Express* option, open and save documents in WordStar, WordPerfect, MultiMate, DCA-RFT, Wang VS, VAX WPS + and other standard formats.
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 - Label headings with diamonds (◆) or Chicago, Harvard, section number, or custom formatted markers.
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 - Labels are renumbered automatically when you move items.
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 - Open as many windows as your Macintosh allows—on one or many documents simultaneously.
 - Scroll using standard scroll bar or arrow keys.
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New Products

*Information on the Mac's latest software,
hardware, and accessories*

Edited by Suzanne Stefanac

This section covers Macintosh products formally announced but not yet evaluated by Macworld. All prices are suggested retail. Please call vendors for information on availability.

SOFTWARE

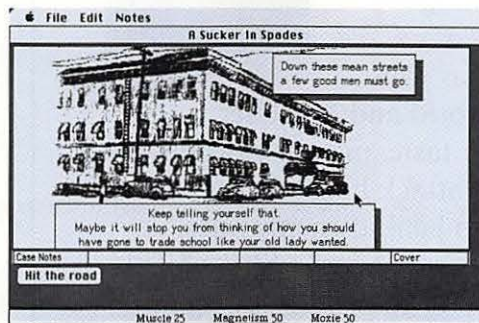
A Sucker in Spades Hypertext mystery story set in postwar Los Angeles. Interactive narrative. 512KE min. memory. \$15. Eastgate Systems, 617/782-9044.

Archie Recording-studio management software system for automating client and producer tracking, inventory, timesheets, invoices, and statements. 1MB min. memory; requires hard disk. Single user \$795; 2 to 4 work stations \$1095; each additional user \$100. Words and Deeds, 213/255-2887.

Clip Art 3-D, Image Folio Clip Art 3-D features more than 2500 professionally produced 3-D objects and fonts that can be customized. Image Folio contains over 4000 photographic images and an editing program for customizing the TIFF files in the database. Requires CD ROM reader. \$399 each. NEC Home Electronics, 312/860-9500.

Coins/Plus Description and latest market value for over 2300 United States coins for collectors. 512K min. memory. \$95 plus \$1.75 s/h; \$25 upgrade each January. Compu-Quote, 818/348-3662, 800/782-6775.

Computerized Classic Bookkeeping Accounting client write-up system organized according to traditional original-entry bookkeeping format. Based on Excel, CCB supports cash disbursements, cash re-



A Sucker in Spades

ceipts, payroll, general, recurring, wage accrual, and nonstandard journals. Search and error-detection capabilities. Produces full-color charts and graphs. Requires Mac Plus; 20MB hard disk recommended. \$995. Absolute Solutions, 800/633-7666, 800/458-3399 in California.

Comstock Desktop Photography Collection of 500 stock photographs from leading photo agency on 5-inch CD ROM. 132-page, full-color catalog. \$500. Comstock, 212/353-8686.

Copyrights, Trademarks, & Patents Comprehensive coverage of U.S. government guidelines concerning copyright, trademark, and patent registration. Includes the necessary application forms. Aimed at business professionals, writers, composers, software developers. \$49.95. Aardvark Development Labs, 713/872-8085.

Crapsmaster Simulates the casino game of craps; enables players to learn the game and test betting strategies. 512K min. memory. \$39. Centron Software, 800/848-2424.

Dreams Integrated set of design tools: Draft Palette for bezier and spline curves, freehand shapes; Accessory Palette for zooming, rotating around various axes, ex-

tending lines to intersection, creating fillets, adding and deleting handles within polygons, gluing and ungluing edges, adding and subtracting objects; Dimension Palette for point-to-point and object-dependent dimensioning in horizontal, vertical, and slope directions. Tools function interactively through add-on modules. Compatible with all MacDraft documents. Full Mac II color support, layers (limited only by memory), high-performance zoom (up to 32-times), advanced text-handling, PostScript compatibility. 1MB min. memory; requires hard disk. \$500; \$200 to MacDraft owners registered before July 30, 1988. Innovative Data Design, 415/680-6818.

edifice Integrated program for elected officials. Modules for administrating, accounting, constituent tracking, legislative tracking, desktop publishing, and telecommunicating. Requires Mac SE; 20MB min. memory with hard disk. \$1495. Stagecoach Technologies, Inc., 602/266-1179, 800/882-7243.

Facts and Faces of U.S. Presidents Educational stack in game format for teaching facts about U.S. presidents. Instructors can read student passwords and print scores. 1MB min. memory. \$49.50. Visatex Corp., 408/866-6596, 800/722-3729.

FamilyCare Assists in evaluating and treating children's health problems. Easy-to-follow directions and recommendations for nonemergency medical conditions. Suggests over-the-counter medications and dietary changes. 512K min. memory. \$99. Lundin Laboratories, 800/426-8426, 313/559-4561.

(continues)

Real Action. Real Sound. Real Fun.

A Around one corner there's a fire-breathing dragon. Around the next, the torturer cracking his whip. Any second you may get an arrow in the back. This must be *Dark Castle*. Your quest is to topple the evil Black Knight in battle. But first you must fight the horde of nasty defenders. Relentless action, stunning graphics and more than 70 digitized sounds explain why *Dark Castle* has won top game awards from both Macworld and MacUser.

✈ If scary old castles aren't your taste, picture yourself strapped into an attack helicopter with a do-or-die mission behind enemy lines. Now you're ready for *Apache Strike*.™ This arcade-style game pits you against defending tanks and helicopters as you fly your chopper through the urban canyons of enemy cities. You get help from L.I.N.D.A., the sweet-voiced on-board computer who warns you of "enemy behind" or "fuel pod damaged." But the ultimate test in *Apache Strike* is your flying skill—and your nerve.

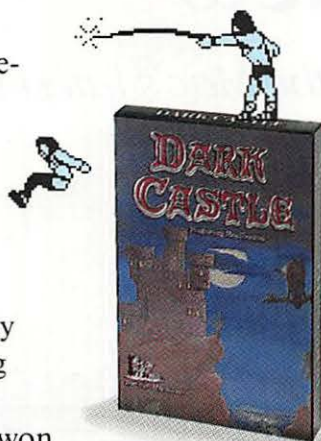
👉 So you think the castle is safer after all? Think again. And welcome to *Beyond Dark Castle*, which picks up where *Dark Castle* left off. The Black Knight has returned, but venomous snakes, flying vultures make him even harder to reach. Scrolling and a cataclysmic finale combine to make this a worthy sequel to *Dark Castle*.

System Requirements:
Macintosh Plus, SE or
Macintosh II. Suggested
Retail Price: \$49.95 each



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Inspiration Outlining and idea-organizing program. Creates free-form diagrams that can be printed as presentation-quality material. 512KE min. memory. \$149. Ceres Software, 503/245-9011.

Instrument Archive Instrumentation data-management system for consulting engineers, construction contractors, plant engineering departments, and plant maintenance departments, as well as petrochemical, chemical, pulp and paper, and mining industries. Entry and retrieval of highly specific technical data and specifications for industrial instrumentation; database size limited only by memory (2000 instruments can be completely specified with 20MB hard disk). Generates indices, reports; allows search queries; data import/export using ASCII/Text, DIF, and SYLK formats. 2.5MB min. memory; requires 20MB hard disk. Single-user license \$2500. Desktop Engineering Ltd., 604/980-9619.

LaserPak 100 Four double-sided disks with 30 shareware laser fonts, 60 PostScript files, and 7 laser utility programs. 512KE min. memory. \$25 plus \$4 s/h. Budgetbytes, 913/271-6022, 800/356-3551.

Learn 88 Series of four tutorials for Adobe Illustrator 88. Each module—Beginning Illustrator 88, Intermediate Illustrator 88, Creating Special Effects, and Precision Drawing Techniques—includes audiotape, practice disk, and summary card. 1MB min. memory. Each module \$49. Personal Training Systems, 408/559-8635.

Lunar Rescue Space adventure. Players search for stolen control crystals that maintain automated lunar defense network. Combines graphic action with need for entrepreneurial skills. 512KE min. memory. \$59.95. PCAI, 612/427-4789.

Lung Cancer Staging—A Tutorial Designed at the University of California San Diego Medical School as introduction to the international TNM classification for Staging Lung Cancer and American Thoracic Society's Lymph Node classification. Divided into three parts: Tutorials, Quizzes, and Management. 512K min. memory. \$75. Chariot Software Group, 619/298-0202.

Matlab Integrated analysis program that specializes in matrix computation, numerical analysis, signal processing, and graph-

(continues)

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Develop your ideas in Digital Darkroom.

1 A classic arch becomes the anchor for this surreal composition. After eliminating unwanted areas, a stair-step design is added.

2 After being cut from its background, a skyscraper is added. A false bottom is created with simple retouching.

3 With the help of automated paste controls that replace tedious pixel editing, the waves wrap around the arch.

4 Using brightness and contrast controls, dramatic clouds are salvaged from an underexposed original and then pasted into the background.

5 Finally, the children step out of an otherwise ordinary photo — with the help of the Magic Wand automatic selection tool — to add the key dramatic element to the composition.



Imagine a computerized darkroom...in your Macintosh.[®] Software that gives you more control over grayscale images than even the most skilled photographer. That's Digital Darkroom.[™]

Unique "intelligent" tools eliminate much of the work in creating dramatic compositions, whether you're a beginner or a professional. You can automatically select objects using the Magic Wand, or blend one image into another with simple slider controls. You can freely slant, stretch or rotate your image to get precisely what you want.

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Special introductory price: \$295.

System requirements:
Macintosh Plus, SE or Macintosh II

Silicon Beach Software, Inc.
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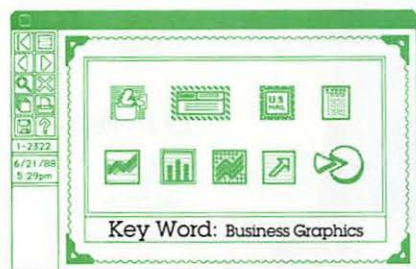
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ISN'T THIS WHY YOU BOUGHT YOUR MACINTOSH?



All of us purchased our Macs for managing data of one type or another. And although there have been data base programs since the Mac was first introduced, using them made you wonder what the fuss was all about. Their performance made you question why you bought your point and click Mac in the first place. When it came to organizing information, you and feel like. After all, how useful is it really to have to exit the program you're using just to part number form? Well, happy to tell has changed.

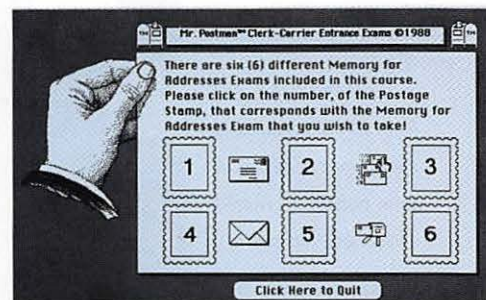


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New Products

ics. Accepts commands in standard mathematical notation for matrix operations. Interactive graphics with color on Mac II and data interface with FORTRAN and C-Language. Mac Plus or SE with 68020 accelerator board and 68881 math coprocessor can take advantage of Matlab's Mac II features. 1MB min. memory. \$895; \$395 for universities. The Math Works, 617/653-1415.

McPrint C source-code beautifier and re-formatter that is multiwindowed and menu driven. Fully conforms to Macintosh user-interface standard. Allows easy, simultaneous manipulation of multiple large source-code files. Controls formatting and alignment of comments, placement of spacing and braces, and alignment and breaking of continuation lines. Includes editing and search functions. Works with most Mac and non-Mac C compilers. \$59.95. MMC AD Systems, 408/263-0781.



Mr. Postman Exams

Milo Mathematical problem-solver that is a WYSIWYG technical word processor, symbolic algebra program, and graphic tool. 512K min. memory. \$250. Paracomp, 415/543-3848.

ModaCAD A fashion CAD system with image processing, pattern generation capabilities, and an extensive library of block patterns and templates. 2MB min. memory. \$5000-\$30,000. ModaCAD, 213/271-7704.

Moebius: The Orb of Celestial Harmony Fantasy role-playing game with real-time, animated martial arts combat simulator. In Asian setting, players face wild animals, natural disasters, and human opponents of increasing skill in their quest to perfect their concentration. 512K min. memory. \$39.95. Origin, 603/644-3360.

Mr. Postman Clerk-Carrier Entrance Exams Tutorial stack for preparing for the United States Postal Service Clerk-Carrier En-



Retriever

trance Exam. Practice routines in Address Checking, and Memory for Addresses. Features include Elapsed Test Timer, Score Evaluation Chart, Final Score box, and a copy of Barron's *Test Prep Series: Postal Distribution Machine Clerk Examination*. 1 MB min. memory. \$24.95. Mr. Postman Software, 702/646-1303.

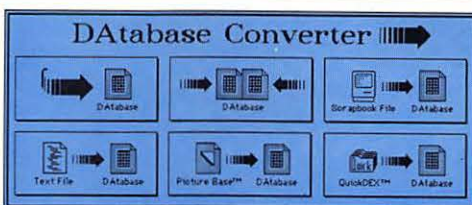
PerfectStudy Organizes study materials through the association of keywords and definitions. Modules created from course materials ask questions, then repeat in random order those answered incorrectly. 128K min. memory. \$79.95. Powerware, 801/224-5033.

PT-109 Torpedo boat simulation, set in Solomon Islands or Mediterranean. Player can go after submarines with depth charges, torpedos, surface guns. Multiple levels of play, 45 different missions, night and day. 1MB min. memory. \$49.95. Spectrum HoloByte, 415/522-3584.

Retriever Desk accessory accesses list-based data without leaving the current application. Can export to other files and create custom Retriever file with matching HyperCard stack, as well as sort, search for, and print stored information. 512K min. memory. \$89.98. Exodus Software, 513/522-0011.

SPP Analog signal processing program that analyzes linear and nonlinear systems and their effect on user-specified time-

(continues)



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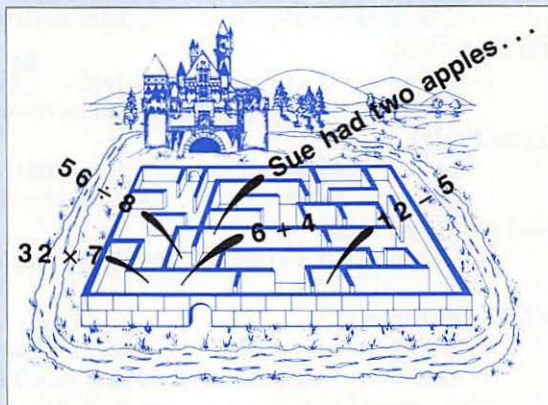
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- Statistical report on each child's performance.
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\$49.95

Recommended ages: 5-12
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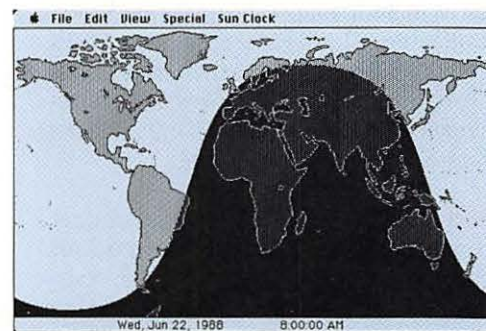
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New Products

domain waveforms. Optional CGA, EGA, and pen-plotter drivers. 512K min. memory. \$125. BV Engineering, 714/781-0252.

SUM (Symantec Utilities for Macintosh) Disk utilities package that restores crashed disks and deinitialized hard disks and recovers accidentally deleted files. Also includes disk partitioning, optimization, fast duplication, and file and disk viewing and editing. Based on MacZap. 512KE min. memory. \$99.95. Symantec Corp., 408/725-2731.

Sun Clock DA that shows where the sun is shining at any given time on an accurately drawn map. Can also be used to tell approximate time anywhere in the world. 128K min. memory. \$15. MLT Software, 503/245-4093.



Sun Clock

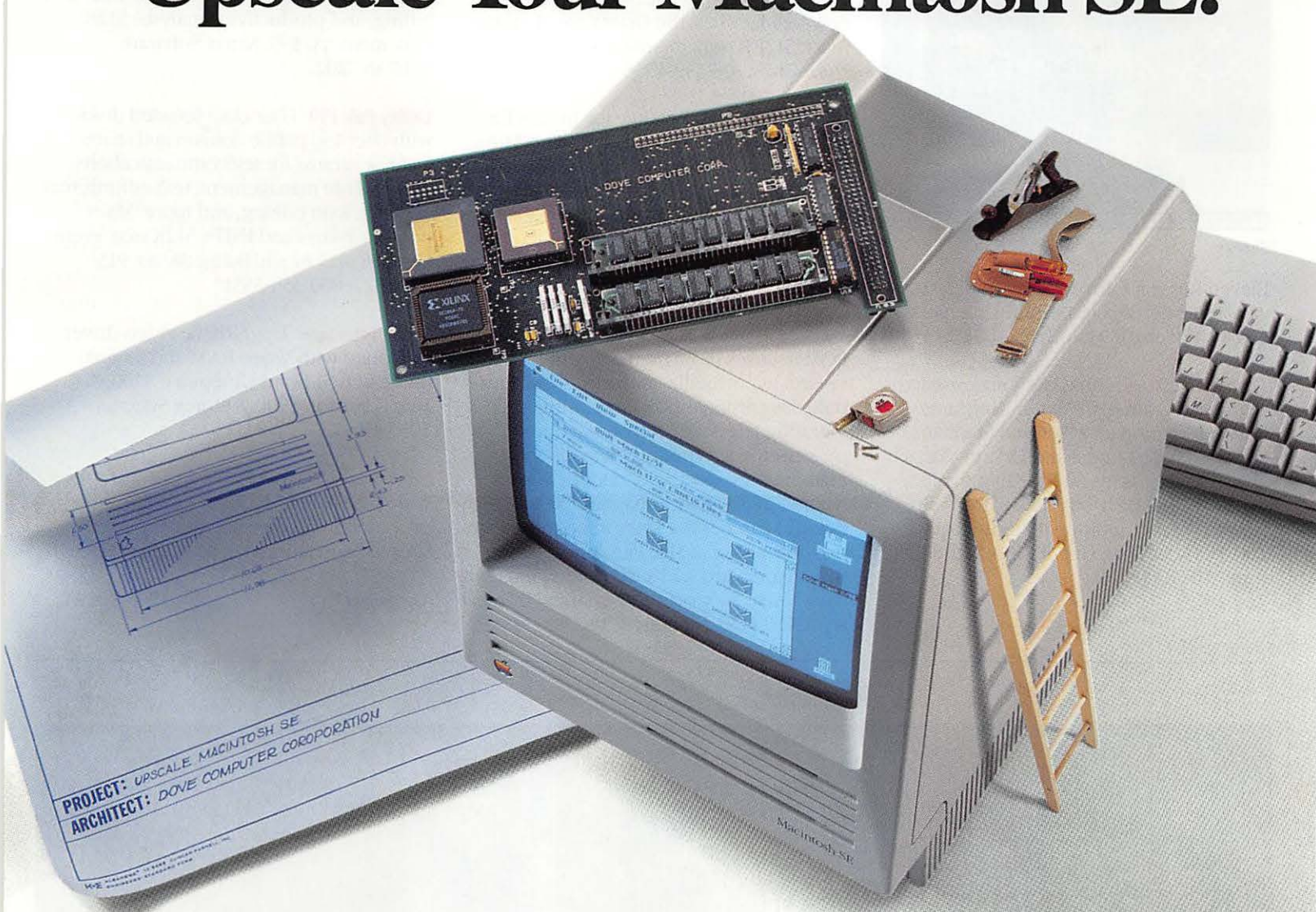
TakeOff Custom construction estimation system for general contractors. Logs distance and area measurements of objects digitized with PenMac Graphics Table Systems. 1MB min. memory. \$1995. 4Site Technologies, 408/475-8444.

TangentShare Uses a PC as server host, providing equal access from any IBM PC, PS/2, or Macintosh, allowing them to store files and applications on a single storage device, use the server as a local disk drive, or transfer files between incompatible systems. Server and Client software \$700. Tangent Technologies, 404/662-0366.

Tetris Game designed by two Soviet programmers. As groups of four squares fall from the top of the screen, player attempts to manipulate them into straight rows.

(continues)

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Tetris

Eleven Russian folk tunes accompany the various levels of play. 1MB min. memory. \$34.95. Spectrum HoloByte, 415/552-3584.

The Perfect Word Bible study and research search-program. Full text in King James, New International, or Revised Standard. Greek New Testament and Hebrew Tanach also available. Runs on 512KE min. memory with hard disk; otherwise, 1MB min. memory. \$230, additional English texts \$60; Hebrew \$120; Greek \$130. Star Software, 407/831-8050.

The Stylish, The Giants Two new volumes of World Class Fonts. The Stylish features 33 new font families; the Giants are ultralarge fonts. 512KE min. memory. \$79.95 each. Dubl-Click, 818/349-2758.

Time Billing New module for Insight Expert Accounting Series. Full-featured time and billing software package for the small-to medium-size professional services market. Each billable task or reimbursable expense can be described in detail on invoices. 1MB min. memory. \$695 single user. Layered, 617/242-7700.

Time Table of Science and Innovation CD ROM features more than 600 graphics and several hypermedia animations that illustrate the chronology of computing, cryptography, television, telephony, time measurement, typography, weaponry, mathematics, electricity, and the role of women in innovation. Xiphias' Xearch technology searches the stack in no more than two seconds on a Mac Plus, much faster than HyperCard 1.2.1's improved Find command. Also supports conventional Boolean searches. \$150. Xiphias, 213/821-0074.

TimeCard Time-tracking utility supplies employee time summaries for payroll, time billing, and productivity analysis. 512K min. memory. \$99. Aatrix Software, 701/746-7202.

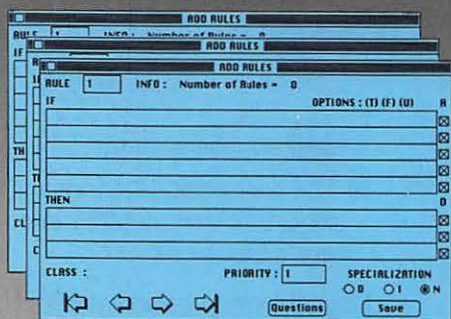
Utility Pak 150 Four double-sided disks with over 150 public domain and shareware programs for telecommunications, disk and file management, text editing, text copying, icon editing, and more. Many popular F-keys and INITs. 512K min. memory. \$25 plus \$4 s/h. Budgetbytes, 913/271-6022, 800/356-3551.

Video Interface Upgradable video driver. Equipped with Video RAM and a signal processor. 512K min. memory. \$700; Mac II version \$900. Nutmeg Systems, 203/966-3226.

VideoWorks II Accelerator Utility for use with VideoWorks II. Runs a compilation process on VideoWorks II documents, speeding up animation to at least 30

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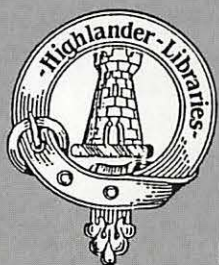
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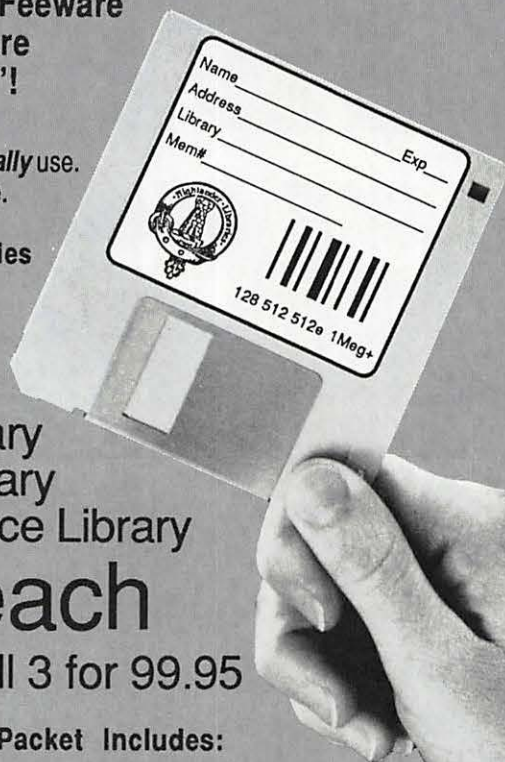
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Where in the World Is Carmen Sandiego?

frames per second. Also works inside HyperCard. Comes with its own XCMD and stack, with examples and online documentation. 1MB min. memory. \$195. MacroMind, 312/871-0987.

VideoWorks II HyperCard Driver Utility for use with VideoWorks II. Imports color and full-screen animation into HyperCard. Plays animation sequences on top of a card, within a card, or on the entire screen. 1MB min. memory. \$99.95. MacroMind, 312/871-0987.

Where in the World Is Carmen Sandiego? Carmen and her notorious gang of thieves embark on a worldwide crime spree, stealing priceless national treasures. Trail and capture them. Comes with the 1988 World Almanac as reference. 512K min. memory. \$39.95. Brøderbund Software, 415/492-3200, 800/527-6263.

HARDWARE

AppleCrate 80 80MB external hard disk that fits under the Mac, comes with all necessary cabling and software. Seagate SCSI drive; additional SCSI port with externally accessible SCSI ID selector. \$1249. AppleCrate, 818/766-4001.

ColorCapture Plug-in color frame-grabber board. Captures and displays live-motion color video images in 1/30 second (real-time) on the Mac II. Fits into any Mac II expansion slot. Requires Mac II with color monitor, hard disk, NTSC composite video camera, VCR or still-video device. \$2995. Data Translation, 617/481-3700.

Digital Audio/SMPTE Card Sends and receives audio data in AES/EBU digital audio format for recording CD or DAT recorder data in digital form. Provides SMPTE time

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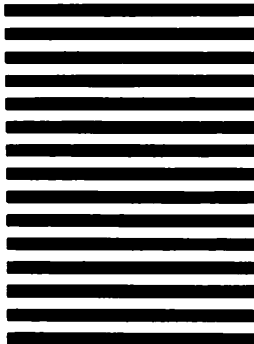
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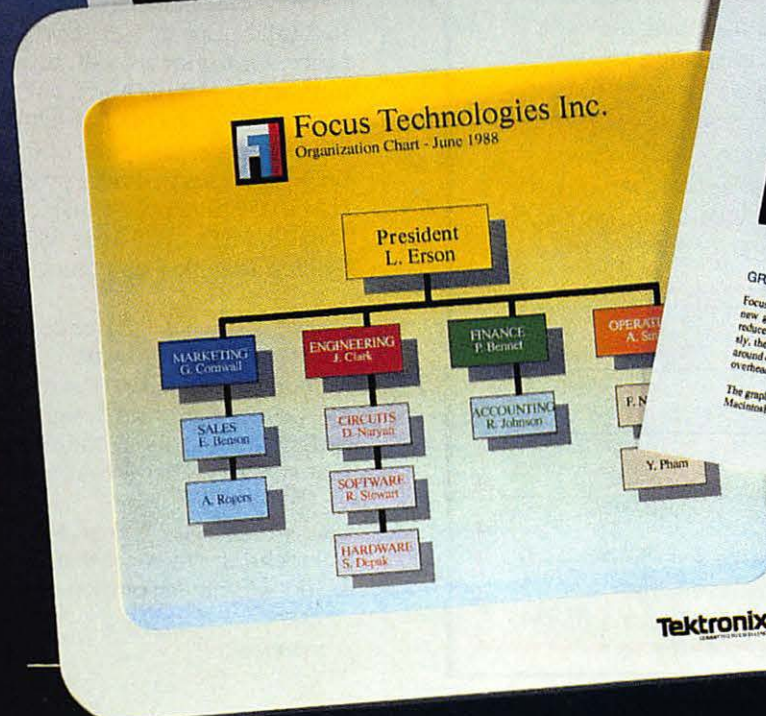
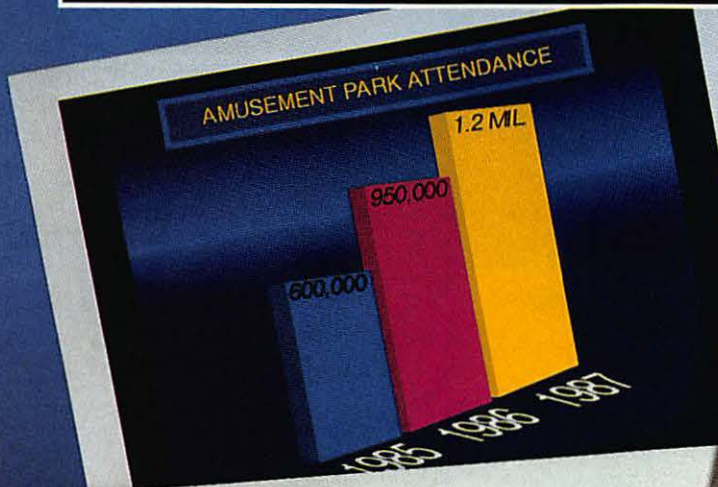
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Recognizing the need for new product development, the 1988 budget reflects a large increase in engineering expenditures. Marketing Resources are also up from last year. In anticipation of the acquisition of a Tektronix color image printer, Marketing will use the new printer to produce more effective customer presentations and internal communications documents such as this one.

Image Printer. This new system is capable of producing color prints on paper or overhead transparency film. Anticipated uses include generating comprehensive proofs for marketing and advertising material, production of presentation graphics materials for marketing and engineering use and (of course) producing your favorite newsletter which you're now reading.



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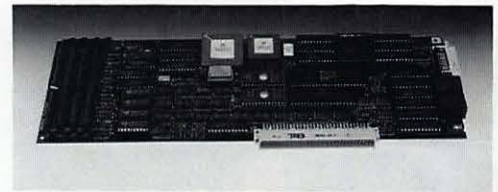
New Products

code reader/generator for locking the speed of playback or recording in the Macintosh to an external multitrack tape recorder or VCR. Requires Mac II. \$995. Southworth Music Systems, 617/772-9471.

E-Machines T16 Uses 16-inch Trinitron Monitor and displays one full page in landscape format—832 by 624 pixels by 8 bits, at 72 dpi, with a refresh rate of 67Hz. Requires Mac II. \$3295. E-Machines, 513/646-6699.

E-Machines T19 Uses a 19-inch Trinitron monitor and displays two full pages in landscape format—1024 by 808 pixels by 8 bits, at 75 dpi, with a refresh rate of 72Hz. Requires Mac II. \$5995. E-Machines, 513/646-6699.

E-Machines TX Uses a 16-inch Trinitron monitor and displays two full pages in landscape format—1024 by 808 pixels by 8 bits, at 85 dpi, with a refresh rate of 72Hz. Requires Mac II. \$4495. E-Machines, 513/646-6699.



FirePower

FirePower Application platform for the Mac II. A full NuBus master/slave with a 68020 processor, optional 68881 floating point unit, up to 4MB of DRAM, two AppleTalk-compatible serial ports, high-performance SCSI interface. Real-time operating system, GT/X, provides real-time processing tightly coupled with A/UX. Available with a 16-MHz, 20-MHz, or 25-MHz 68020. \$2500. Golden Triangle Computers, 619/279-2100.

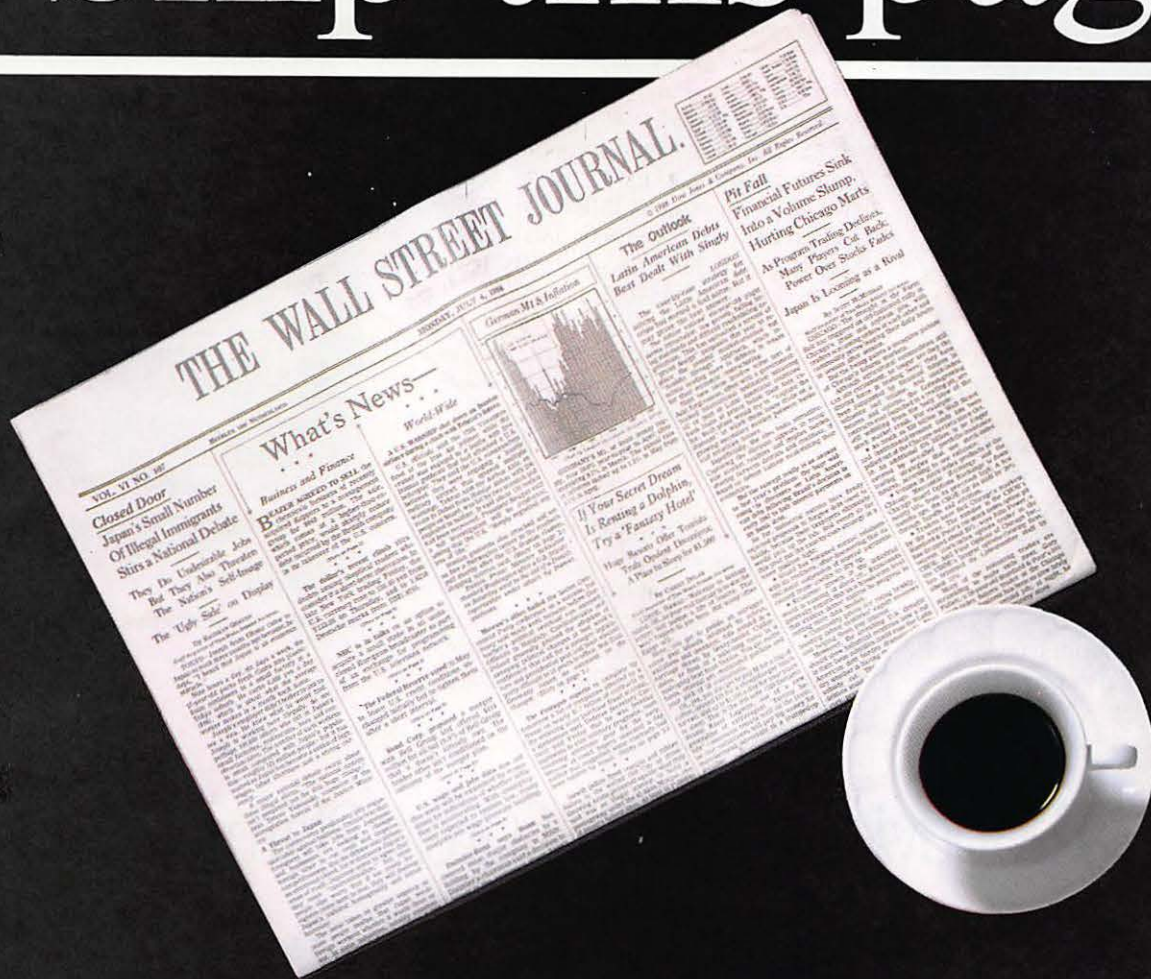
FormsProgrammer Programmer's utility enabling rapid production of custom-designed output, both to a screen display and to a printer. Graphics design program and programming source-code generator. \$99. Ohm Quality Software, 401/253-9354.

Gray Scale Display System Mac II 19-inch monochrome monitor that displays 256 shades of gray. Resolution of 1152 by 882

(continues)

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pixels. Displays two 8½-by-11-inch pages without reducing or scrolling. \$3590. Radius, 408/434-1010.

Intersect CDR-77 External CD ROM reader that plugs into SCSI port. Bundled with Microsoft's CD ROM Extensions. Operates with any CD ROM disk encoded in High Sierra, Mac HFS, or ISO 9660 format. 540MB capacity. 500 milliseconds seek time. 150K-per-second data transfer rate. Requires 1MB. \$999 plus \$199 for Mac SCSI interface kit. NEC Home Electronics, 312/860-9500.

Irwin Model 5080 Minicartridge tape-back-up system. External, self-powered. High-

capacity data transfer between Macs and IBM PS/2s and PCs. Stores 80MB data on one industry-standard DC 2000 mini-cartridge. Includes EzTape software, SCSI interface, 256K cache memory, self-contained power supply. 5040 \$1395; 5080 \$1695. Irwin Magnetics, 313/996-3300.

KISSplus Systems Package Combines QMS KISSplus laser printer with MacKISS software/hardware package, Functionality Card 20, and one black toner cartridge. Features new Canon SX engine, 1MB RAM, 17 portrait and 17 landscape fonts, and dual RS-232C parallel interfaces. \$3395. Laser Connection, 205/633-4866.

Mac-Pac Modem package with 2400-bps external modem, interconnecting cable, and communications software. \$259. Anchor Automation, 818/998-6100.

Mac+PC SE Coprocessor card that enables Mac SE users to run MS-DOS applications simultaneously with Mac applications. Uses 8086 microprocessor, comes with IBM-compatible printer and communication ports. Disk transfer and conversion utilities. Requires Mac SE. \$1195. PerfectTek Corp., 408/263-9842.

MegaTrend/2 Color Monitor A 20-inch color monitor with 640 by 480 resolution and 256 colors. Plugs directly into Mac II color-video card with optional pin adapter. Footprint just over one foot square; has built-in tilt-and-swivel base. Requires Mac II. \$1995 plus \$29 for Mac II pin adapter. Intecolor, 404/449-5961.

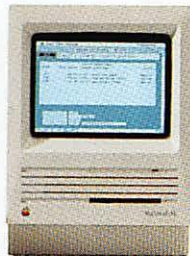


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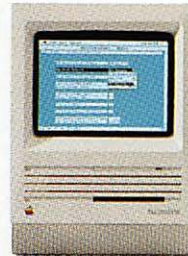
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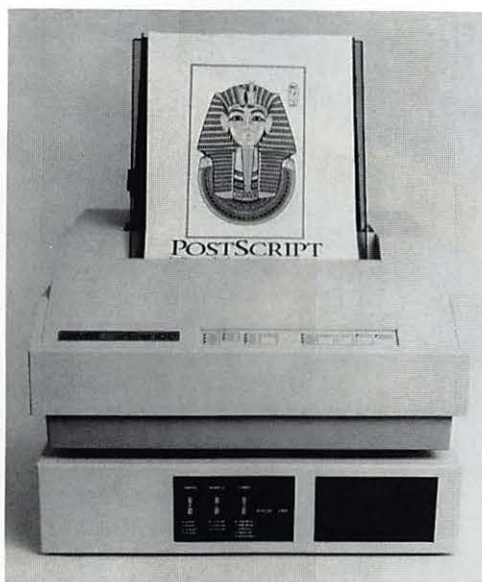
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MultiModemV32 Desktop modem, fully CCITT32 compatible with operating speeds of 9600, 2400, 1200, and 300 bps. Offers dial-up asynchronous, full-duplex operation over public switched-telephone networks for either domestic or international data communications. Also compatible with all appropriate communications standards at lower speeds. \$1495. Multi-Tech Systems, 612/631-3550.

OmniLaser 2106 PostScript printer with printing speed of 6 pages per minute, resolution of 300 dpi, and smaller footprint than OmniLaser 2000 series. Includes 35 resident typefaces and expanded paper-handling features. \$4595. Texas Instruments, 214/995-2011.

Personal Writer 15S A 17½-by-11-inch digitizing tablet, stylus with ballpoint pen, and 15S controlling software. PW15S allows the user to write with block letters on grid-format paper, with ASCII text appearing on the screen. Employs handwriting recognition capabilities, two drawing modes, 12 macro-command boxes, and 200-points-



QMS ColorScript 100 Printer

per-inch resolution. 1MB min. memory (2MB recommended). \$895. Personal Writer, 213/556-1628.

Personal Writer 15SL A 16-by-16-inch digitizing tablet, zero-traveling stylus with ballpoint pen, and 15SL controlling software.

PW15SL allows the user to write with block letters on any type of paper with ASCII text appearing on the screen. Employs handwriting recognition capabilities, two drawing modes, 36 macro-command boxes, and 800-points-per-inch resolution. 2MB min. memory. \$1795. Personal Writer, 213/556-1628.

PLP Share Network adapter that enables network users to share the General Computer Personal LaserPrinter. External box with spooler software, 1MB, and 68000 processor. Connects to AppleTalk network. \$999. General Computer Corp., 617/890-0880.

QMS ColorScript 100 Printer High-resolution color thermal transfer output device. External color PostScript controller, 300-by-300-dpi Mitsubishi G650 thermal transfer print engine, cabling, and manuals. Controller comes with 8MB RAM, 1MB ROM, 68020 MPU operating at 16.67 MHz, and 20MB hard disk. \$24,995. QMS, 205/633-4300.

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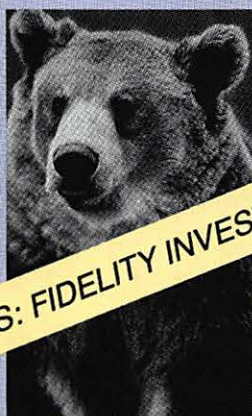
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New Products



Viking 1 Monitor

Silver Shuttle Add-in board that's a synchronous/asynchronous SCSI adapter for the Mac II. Increases transfer rate of Mac II SCSI drive to 2MB per second or 4MB per second (synchronous), up to ten times normal speed. Requires Mac II. Under \$1300. Hard & Soft, 305/772-0430.

The Big Picture C20 Two-page color monitor for Mac II that displays 1024 by 808 pixels at 1 or 8 bits per pixel. Monitor resolution of 76 dpi with 256 colors. \$5195. E-Machines, 503/646-6699.

TransPac Removable 3½-inch hard disks with 20–100MB capacities. Fault-tolerant software can simultaneously write to two hard disks, automatically switching to the backup in the event of a failure. Internal and external models. 20MB \$895; 32MB \$1095; 45MB \$1345; 60MB \$1945; 80MB \$2295; 100MB \$2995. ProStor, 415/974-6462.

Viking 1 Monitor A 19-inch, high-resolution (1280 by 960 pixels refreshed at 66Hz) monochrome monitor that interfaces via Monitorm video controller card. Windows and images can lap across multiple screens. Requires Mac SE. \$1995. Monitorm Corp., 612/935-4151.

VisionScan Flatbed scanner unit includes software, connecting cables, graphics-editor DA, and DeskPaint. Scans even 3-D objects. \$895. Warp Nine Engineering, 800/654-5294.

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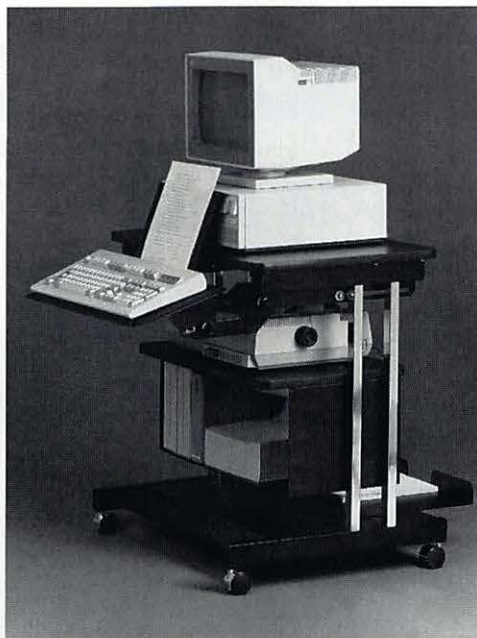
New Products

XC-3310 Monitor 33-inch color monitor with resolution of up to 800 by 600 pixels. Can be used with VCR or computer with no internal adjustments. Receives TTL or NTSD input signals. Requires Mac II. \$5900. Mitsubishi Electronics America, 213/515-3993.

ACCESSORIES

Model 3302CP Mobile computer/printer workstation taking up less than four square feet. Laminate top measures 27½ by 20 inches and comes in black, putty, gray, and wood-grain (oak or walnut) laminates. \$350. Tiffany Stand & Furniture Co., 314/991-1700.

Model 880 LaserFeeder Paper feeder for LaserWriter IINT and IINTX. Two paper bins hold 220 sheets of paper each, envelope bin holds 60 envelopes. Driver software included. \$1395. BDT Products, 714/660-1386.



Tiffany Model 3002UP

PC Viewer 6448C+2 Electronic transparency used with an overhead projector and 1MB memory module that lets real-time or preprogrammed computer data and graph-

ics be projected for group viewing. Includes scrolling and dissolving features. 640-by-480-pixel resolution. \$2795. In Focus Systems, 503/692-4476.

Pro-Tech Ink-Jet Ultra Paper Enhances color and graphics capabilities of ink-jet printers. 250 sheets \$22.95. James River Corporation, 413/589-7592.

Tiffany Model 3002UP Printer stand with three adjustable paper shelves and room for two boxes of forms. Fits printers with footprints up to 17 by 33 inches and comes in black, gray, or putty. \$275. Tiffany Stand & Furniture Co., 314/991-1700. □

To have your product considered for inclusion in New Products, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, Macworld, 501 Second St., San Francisco, CA 94107. We reserve the right to edit submissions.

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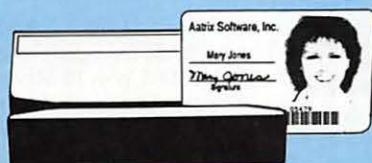
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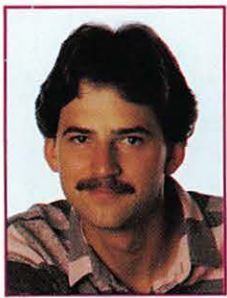
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Quick Tips

Answers to your questions

by Lon Poole

May's column featured an Excel macro for performing a search-and-replace of cell contents. Unfortunately, several lines were mysteriously cut off. In the Fix Cells macro, cell A5 should end with "Fix Cells", and cell A22 should end with GOTO(A27).

Curling Your Quotes

Many people have written to brand as unnecessarily complicated my suggestions for converting plain quotes to opening and closing quotes (see *Quick Tips*, May 1988). Alex Lewin of Cambridge, Massachusetts uses a multistage search-and-replace process with his word processor. Assuming most opening quotes are preceded by a space, he searches for every space followed by a plain quote and replaces each with a space followed by an opening quote. In case he has quotes at the start of paragraphs, he also searches for every end of paragraph followed by a plain quote and replaces each with an end of paragraph followed by an opening quote. (There may be other cases in which the opening quote isn't preceded by a space, for example, a quote in parentheses.) At this point, closing quotes are the only ones left, so he replaces all remaining plain quotes with closing quotes.

Repeating the process with single quotes converts them and all apostrophes used for contractions, possessives, and plurals. (As with double quotes, some single quotes may not be preceded by a space, for example, a quote within a quote.) If the document uses apostrophes but no opening single quotes, replacing all plain single quotes with closing single quotes is sufficient.

Incidentally, you can have plain quotes converted automatically as you type in all applications. Get the free utility *Curlers*, by Tom Phoenix (it's file CURLER.SIT in data library 5 of the Mac Productivity forum in CompuServe's MAUG). Put *Curlers* into your System Folder and the Mac installs it automatically every time you start up. Once it's installed, you can disable or reenable *Curlers* on the fly by alternately pressing the quote key and the Backspace key once or twice until you get the style you want.

An Open and Close Case

If you open desk accessories while using HyperCard without MultiFinder, you may think you must close all the DAs before you can reactivate HyperCard. Clicking the card window to bring it to the front elicits only a beep. A tip in May's *Quick Tips* suggested using the Windows or WindowsDA desk accessory to work around this problem. But Joe Lewis Wilkins of Escondido, California, found that you can resume using HyperCard without closing DAs. You simply click the message box, the tool window, or the pattern window. If the menu bar is visible, you can also choose Message from the Go menu or tear off the Tool or Pattern menu.

Keeping desk accessories open has a drawback, particularly on a small screen. DAs always cover the card window, even when the card window is active. You can move them out of the way (press the ⌘ key and drag their title bars to avoid activating them). You'll find this particularly feasible on a large screen—or on a small screen while using Stepping Out II, a screen extender.

Easy Legal Pages

Normally, LaserWriter software versions 4.0 and 5.0 don't permit printing a legal-size page on manually fed legal paper without a legal-size paper tray in the printer. You could use your fingers or the right-size box to fool the printer into think-

ing it has a legal-size paper tray, as suggested in April's *Quick Tips*.

Bruce Pearson of Gardena, California, and others submitted an easier method. After selecting the US Legal option in the Page Setup dialog, click the Options button. (To access the Options button in Word 3, you must press Shift while choosing Page Setup.) In the LaserWriter Options dialog that appears, select the option Larger Print Area (Fewer Downloadable Fonts). Now when you choose Manual Feed in the Print dialog, the LaserWriter prints a legal-size page on manually fed legal paper.

Hard Disk 20 Start-Up

Is it necessary to use the Hard Disk 20 Start-up disk when starting up a Mac Plus with the newer Systems? A friend of mine never bothers with this.

*Steven Rosencrans
New Orleans, Louisiana*

Donate that floppy disk to charity. Put a System Folder on your hard disk, and your Mac Plus will start up directly from it. Only a 128K or a Mac 512K that hasn't been upgraded with Apple's 800K Disk Drive Upgrade kit needs the special start-up floppy disk. You can get the latest System software for \$49 from your Apple dealer.

Type the ⌘-Key Symbol

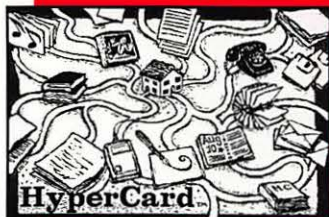
In May's *Quick Tips* you mentioned that the Chicago font contains the ⌘-key and Apple symbols. How can I type them?

*Joan Robertson
Westminster, California*

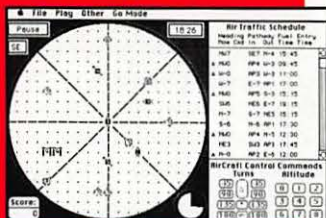
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Lon Poole answers readers' questions and offers advice in his monthly Macworld column. Many of the tips he's compiled can be found in his book Mac Insights (Microsoft Press, 1987).

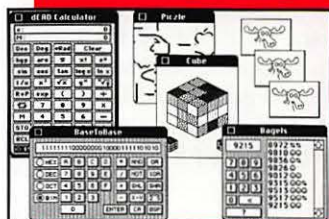
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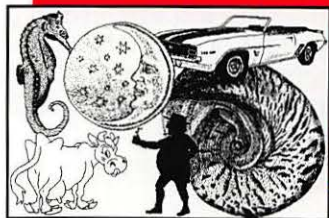
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How To/Quick Tips

A If you have an SE or a Mac II you can type several special symbols in any application. Use the Chicago font and then press Control-Q for the ⌘-key symbol, Control-R for a check mark, Control-S for a solid diamond, or Control-T for the Apple logo.

If you have a Mac Plus, a 512K, a 128K, or an XL, your keyboard has no Control key. Although you can't type the special symbols in every application, you can type them in Microsoft Word 3.0 and later versions. You press ⌘-Option-Q and type the code number of the character you want. With the Chicago font, use code 17 for the ⌘-key symbol, 18 for a check mark, 19 for a solid diamond, or 20 for the Apple logo. You can cut and paste the special characters from Word to another kind of document, or to the Scrapbook for later copying to other documents. Since the characters lose their font information between applications, you'll have to change the font to Chicago after pasting.

You can also create the special symbols using HyperCard's NumToChar function with the same code numbers as Word. To create a ⌘-key character, for example, type the following command in the message box:

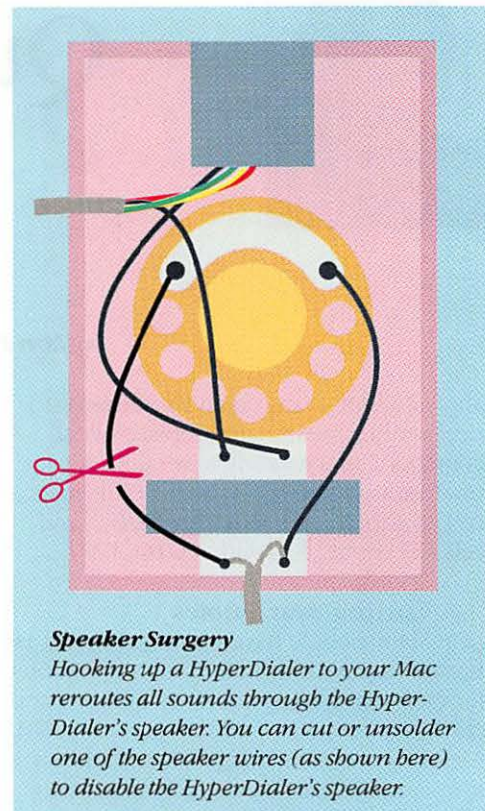
put numToChar(17)

HyperCard immediately replaces your typing with an undefined-character symbol (a small hollow box), which is the best it can do with Geneva in the message box. Select the character, copy it, and paste it to the Scrapbook or another document. After pasting it in another document, change its font to Chicago and it becomes the ⌘-key symbol.

Q Double Sound Port

DataDesk International's HyperDialer is a reasonably inexpensive and convenient accessory for using HyperCard's telephone-dialing capacity. However, connecting it to my Mac SE's speaker port reroutes all Mac sounds through HyperDialer's tiny, nasal built-in speaker, and the surprisingly good sound of the Mac's internal speaker is completely lost. I've tried dialing through my Apple modem, but the voice transmission is severely impaired. How can I have my cake and eat it too?

*Dave Claytor
Ann Arbor, Michigan*



Speaker Surgery

Hooking up a HyperDialer to your Mac reroutes all sounds through the HyperDialer's speaker. You can cut or unsolder one of the speaker wires (as shown here) to disable the HyperDialer's speaker.

A Plugging anything into the Mac speaker port cuts out the internal speaker, unless you open the Mac and rewire the speaker port. For less than \$2, you can buy a small adapter that doubles the number of speaker port jacks (Radio Shack catalog number 274-310). You can then attach not only your HyperDialer but also a small external speaker or a stereo system, either of which provides even better sound than the Mac's internal speaker. To silence the HyperDialer's speaker, you must open it and cut or unsolder one of the wires from the speaker (see "Speaker Surgery"). The HyperDialer is glued shut, but you can gently pry off the bottom and still reclose it.

Incidentally, the two-way port adapter is useful for feeding the Mac's monaural audio output into both left and right channels of a stereo amplifier.

Dialing with a modem may impair voice transmission unless the modem hangs itself up, releasing the phone line to your telephone. Most Hayes-compatible modems, including Apple modems, wait 30 seconds before hanging up. You could include the modem command S7=5 after the HyperTalk Dial command's "with modem" parameter to make your modem hang up after only 5 seconds. However, doing that could interfere with other modem

uses. Instead, I recommend using a HyperTalk Wait command to wait 5 seconds and then a separate Dial command to hang up the modem (presumably after you have picked up the phone). If you're using the Phone stack supplied with HyperCard, add the following lines near the end of the stack script, right above the **Put Empty** command that precedes the **End DoDial** command:

```
--wait 5 seconds, then hang up the modem (if it was
used)
if hilite of bkgnd button "modem (tone dialing)" or
hilite of bkgnd button "modem (pulse dialing)" then
beep 2
put "Pick up the phone now."
wait 5 secs
--hang up modem and reset it to standard settings
send "dial" && quote & quote &&
"with modem" && quote & "ATZ" & quote
to HyperCard
end if
```

Q Clicking Word's Page Number Area

While using Word 3.01, I accidentally clicked the lower-left corner of the document window, where the page number usually appears. The page number changed to the word *Code* in inverse type. What is it for?

*Alfredo Izquierdo
Miami, Florida*

A Word uses the page number area of the document window to get information from you for completing actions initiated by the following keyboard shortcuts:

- Option-⌘-Q, insert a special character
- Shift-⌘-S, apply a style to a paragraph
- Option-⌘-E, change the font
- ⌘-Backspace or ⌘-Delete, insert a glossary entry

When you type any of these keystroke combinations, you'll see a word displayed in the page number area that prompts you to enter additional information. For example, the word *Code* means you should enter the code number of the character you want inserted. (Pressing ⌘-period (.) or clicking anywhere outside the page number area cancels the keyboard shortcut.)

(continues)



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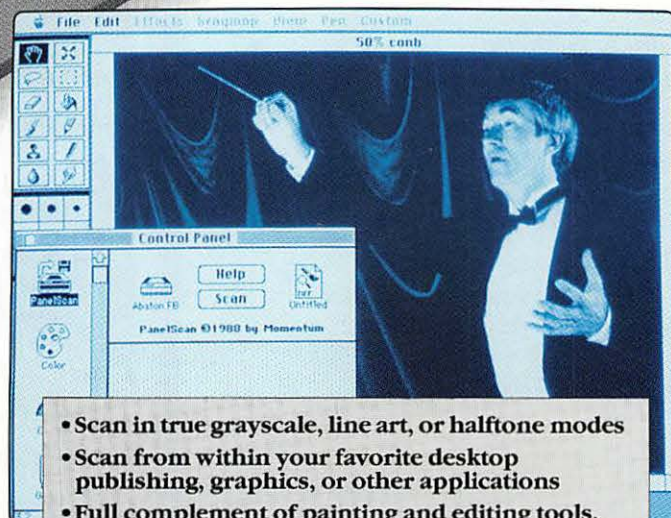
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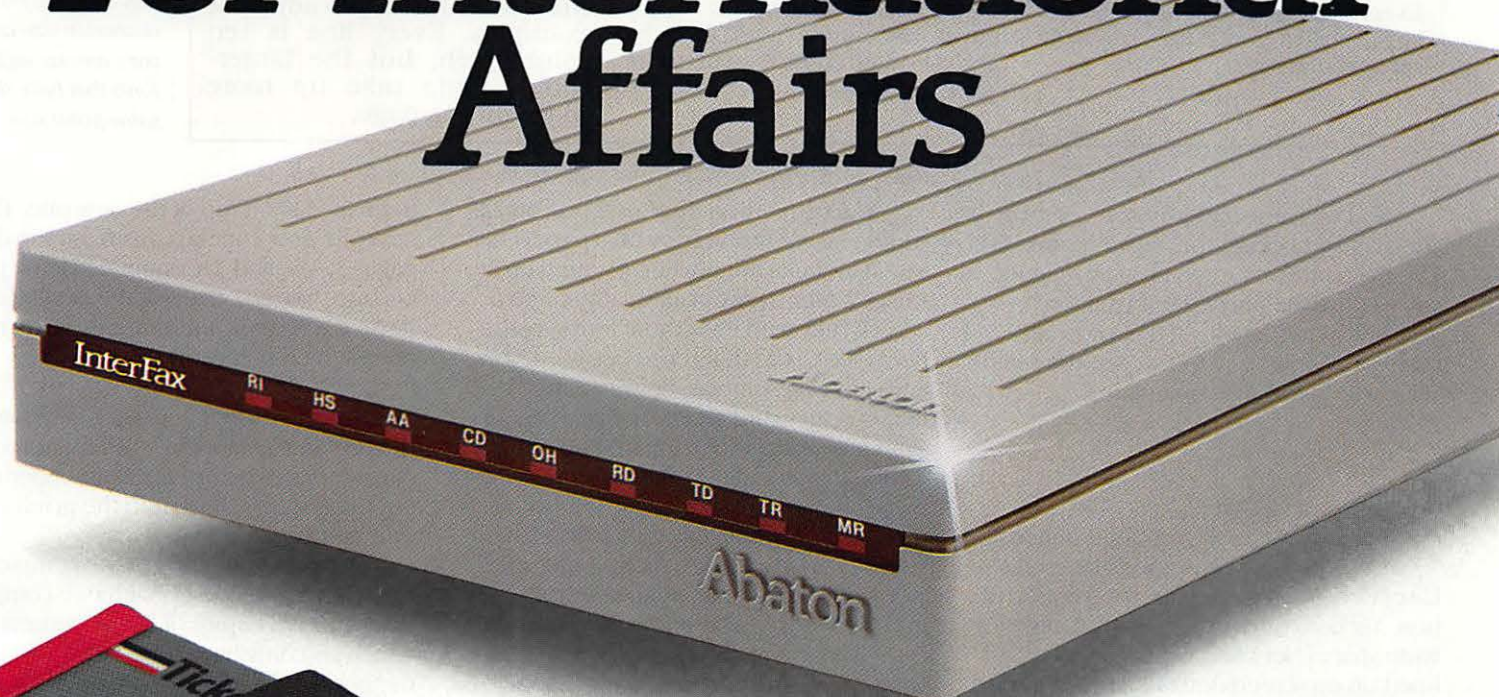
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This copy is set in ten-point Times in a column twelve picas (72 points) wide. It is set solid, with no extra space inserted between the lines, to facilitate comparing its apparent size with the two adjacent examples. Every line is ten points high, but the larger-bodied fonts take up more space on the page.

This copy is set in ten-point Palatino in a column twelve picas (72 points) wide. It is set solid, with no extra space inserted between the lines, to facilitate comparing its apparent size with the two adjacent examples. Every line is ten points high, but the larger-bodied fonts take up more space on the page.

This copy is set in ten-point Bookman in a column twelve picas (72 points) wide. It is set solid, with no extra space inserted between the lines, to facilitate comparing its apparent size with the two adjacent examples. Every line is ten points high, but the larger-bodied fonts take up more space on the page.

Font-Size Fakery
Font size measures the maximum height of a line of text, not overall character size. These three typefaces demonstrate how character size can vary among different fonts that have the same point size.

You can repeat the most recently used shortcut by clicking the page number area. The prompt word appears again, cueing you to type the needed information.

For more details on the lower-left corner of the Word window, see the topic Windows in the Word manual.

Q Spaced Out

Suppose I create a document using 10-point New York type and print it on a LaserWriter using the Font Substitution option. My bold titles end up with double-wide spaces between words, and words I lined up on screen don't line up on paper. So following Erfert Nielson's advice in "Fit to Print" (April 1988), I changed the document from New York to Times. Now my document is much shorter on screen. Will it print smaller as well? Why is 10-point Times smaller than 10-point New York? How can I eliminate the double-wide spaces and keep words aligned?

Wayne Folta
via MCI Mail

A Fonts are like baseball fans sitting in the bleachers. Fewer fat fans than skinny fans fit across a bench. Sure, height matters—adults are wider on the whole than children—but height alone doesn't tell you how many benches a group of fans will fill. Likewise, wide font families such as New York occupy more space on a line than thin font families such as Times. Font size measures maximum character height but says nothing about other character proportions, as illustrated in "Font-Size Fakery." Unfortunately, there is no way to measure the way type will actually appear. You must try each font to see how it fits on a page.

You can rely on displayed line breaks when you are fitting copy on a page. The Mac maintains them when printing on an ImageWriter in any print quality or on a LaserWriter with or without font substitution. Due to the difference between print and screen resolution, however, the Mac may change word and character spacing slightly on paper to maintain line breaks. Although you can't do anything about these changes (except to use fractional pixel widths in the few applications that support them), they're more noticeable when you're trying to align text with graphics. Gaps between words widen with LaserWriter font substitution because LaserWriter fonts are narrower than screen fonts. Compose in LaserWriter fonts to avoid "gaposis."

Because the Mac doesn't maintain word spacing exactly when printing, words aligned with spaces on screen may not stay aligned on paper. Font substitution worsens the misalignment because a space character's width in a screen font differs from its width in the substitute LaserWriter font. Use tabs, rather than spaces, for reliable alignment.

Print Both Sides Now

Tip: Frequently I have to print documents on my LaserWriter II on both sides of a page. Unfortunately, PageMaker and other applications do not allow you to print odd-numbered pages in one batch and then, after turning the paper over, print even-numbered pages in a second batch. I have found a method for printing two copies of double-sided output without sitting at the Mac and producing one double-sided page at a time.

First, print one complete copy of the document. If necessary, arrange the pages consecutively with page 1 on top. Place the stack faceup. Take the first two pages (1 and 2) and lay them faceup in a new pile. Then take the next two pages (3 and 4) and place

them faceup on top of the new pile. The new pile now contains, from the top down, pages 3, 4, 1, and 2. Continue placing pairs of pages faceup on top of the new pile. If the last page is odd-numbered, do not place it on the new pile; put it aside for now.

Put the rearranged stack facedown in the printer's paper tray, with the top of the pages toward the printer. Remember not to put the last page back into the printer if it is odd-numbered.

Print another copy of the complete document. You end up with two complete double-sided copies of the document, which you only have to separate. This method works for any even number of finished copies. "Two-Faced" shows what you have after the second printing.

Barton M. Bauers, Jr.
Wallingford, Connecticut

This method works equally well on a LaserWriter, a LaserWriter Plus, or an ImageWriter with a sheet feeder.

MacDraw Text on the Edge

Tip: MacDraw normally won't let you drag text right to the edge of a drawing. To get text closer to the edge without adding more pages to the drawing size, reduce the font size of the text, drag the text closer, and then change the font size back again.

Perry Thieme
Milwaukee, Wisconsin

MacPaint 2.0 Shortcuts

Tip: If you hold down the Option key when starting MacPaint 2.0, you get the Open dialog box instead of a blank document.

When the Grabber tool is selected, dragging while holding down the ⌘ key moves the whole window, not just the

(continues)

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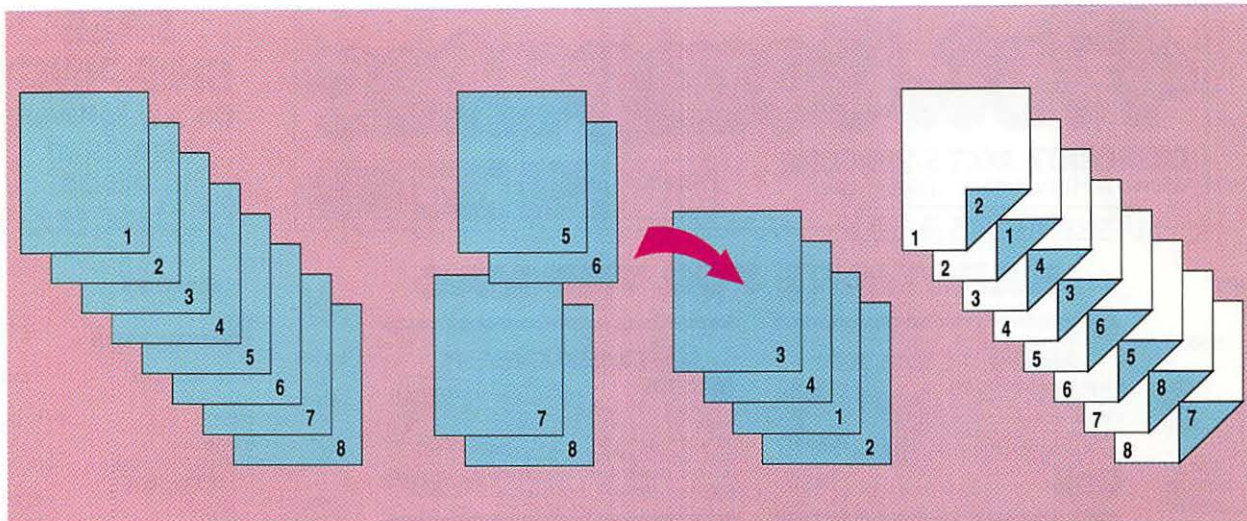
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Two-Faced

To print a document on both sides of a page, print the complete document, rearrange the pages in the order shown, and place the stack face-down in the printer. Then print the document again. You'll get two double-sided copies.

drawing. (This doesn't work when you press the Option key to temporarily use the Grabber tool while another tool is selected.)

Bruce Brodnax
Costa Mesa, California

AutoHilite Means Deselect

Tip: Normally a HyperCard script can use the container named Selection to get the text currently selected in a field. But Selection has an empty value after you click a button whose AutoHilite property is true (the AutoHilite option is selected in the button's Button Info dialog box). Clicking such a button automatically deselects the current text selection. To avoid the problem, make sure the AutoHilite property is false for any button having or using a script that includes the Selection container. Either deselect the AutoHilite option in such a button's Button Info dialog box, or use a Set command to set the button's AutoHilite property to false.

Jeff Lindsay
Appleton, Wisconsin

The automatic deselection you describe also affects the functions SelectedChunk, SelectedField, SelectedLine, and SelectedText (all available only in HyperCard version 1.2 and higher).

You can get the effect of automatic highlighting and still get the contents of the current selection. When the mouse button is down, get the selected text and then set the button's hilite property to true. When the mouse button is up, set the button's hilite property to false. For exam-

ple, you could add the following three lines to the beginning of your MouseUp script:

```
get the selection
set the hilite of the target to true
set the hilite of the target to false
```

This script makes the button flash when it's clicked. However, the button doesn't stay highlighted when you hold the mouse button down with the pointer over it, as buttons normally do.

Spacey and Irregular

In preparing my résumé using WriteNow, I noticed that halfway through the document the spacing between characters became irregular (after about ten lines of text, the problem cleared up and did not reappear). Retyping, cutting, and font switching all failed to correct the problem. When I printed the document on my ImageWriter II, the faulty spacing manifested itself as letters and portions of letters of differing widths.

Michael G. Kaloyanides
Bethany, Connecticut

Undoubtedly the gap-toothed display and lumpy printing occurred because the affected text was an uninstalled font size, such as 11-point or 13-point. In WriteNow, that can happen if you press \mathbb{N} -9 or \mathbb{N} -0, the shortcuts for the Smaller and Larger menu commands. To fix

the bad text, select it all and choose an installed font size from WriteNow's FontSize menu. Installed sizes are always listed in the menu in outline style.

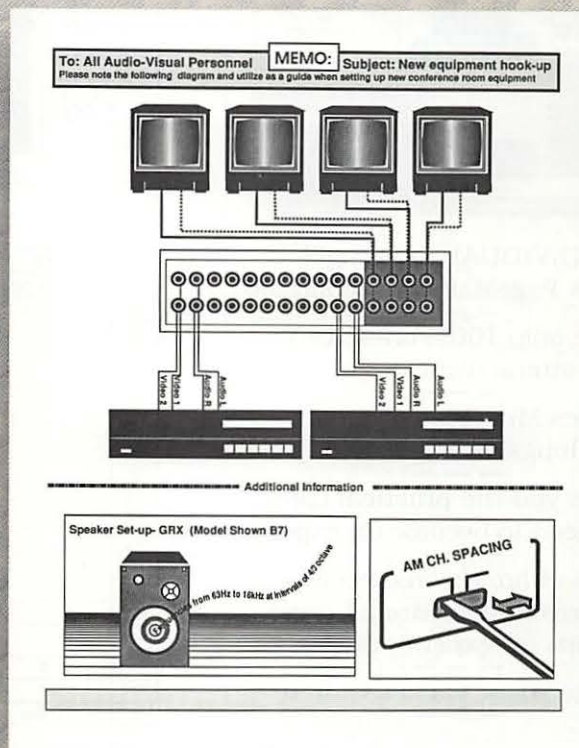
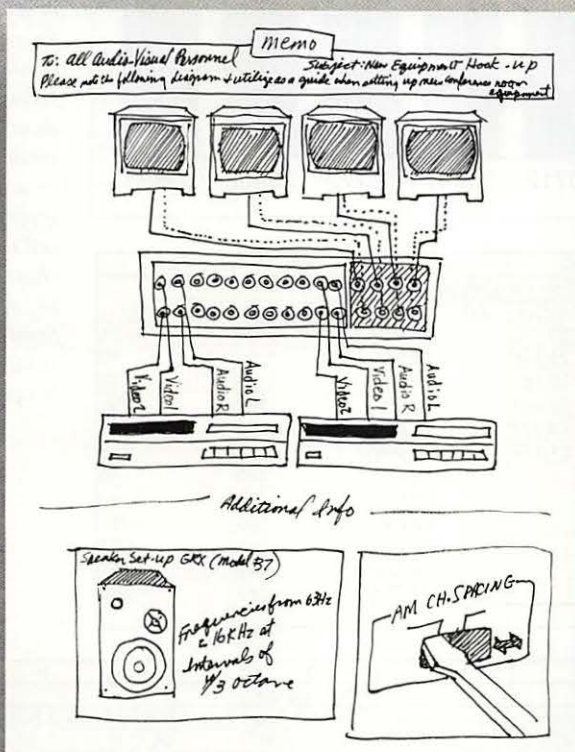
Self-Adjusting Formulas

Tip: I use Microsoft Excel to track expenses for several tasks in a large project. In one part of my worksheet, I enter budgeted and actual expenses in separate columns for each task, using one row for each month. (The month names are actually dates such as 1/1/88, formatted using a number format of MMM.) I use Excel's Extract command to copy each task's actual and budgeted amounts for all months into another part of the worksheet, and a chart graphs the extracted amounts. Thus one chart works (with no changes) for any task in the entire project. By extracting each task in turn and printing the resulting chart, I can easily graph every task in the project. The two areas of the worksheet and the chart are shown in "One Chart for All Seasons."

Excel graphs zero amounts for the blank actual values of future months. The zero amounts clutter the chart and skew the scale of its vertical axis. Each month I could avoid graphing the future months by manually resetting the cell range in the chart's series formulas. Instead, I use named cell references in the chart's series formulas and define those names using Excel's Index and Match functions, which automatically reset the range of cells to be plotted. Specifically, I name the range of cells that contains the dates as DATES, and I name the cell that contains the current

(continues)

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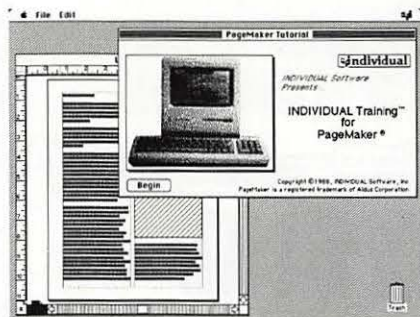
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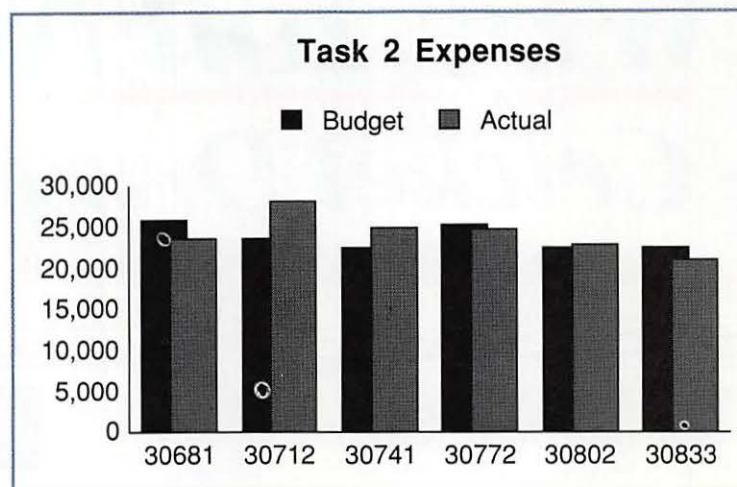
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How To/Quick Tips



	AB	AC	AD	AE	AF
1	One task extracted from the Database				
2	Date	Task 2 Actual	Task 2 Budget	Actual Σ	Budget Σ
3	Jan	23,715	26,065	24	26
4	Feb	28,246	23,751	52	50
5	Mar	25,101	22,696	77	73
6	Apr	24,861	25,437	102	98
7	May	23,017	22,696	125	121
8	Jun	21,179	22,696	146	143
9	Jul		22,696	146	166
10	Aug		22,696	146	189
11	Sep		22,696	146	211
12	Oct		22,696	146	234
13	Nov		22,696	146	257
14	Dec		27,752	146	285
15					

	A	B	C	D	E	F	G
1	The Database						
2	Date	Task 2 Actual	Task 3 Actual	Task 4 Actual	Task 2 Budget	Task 3 Budget	Task 4 Budget
3	Jan	23,715	28,072	3,317	26,065	30,478	6,741
4	Feb	28,246	29,684	3,754	23,751	30,478	6,741
5	Mar	25,101	29,382	4,803	22,696	30,478	6,741
6	Apr	24,861	33,628	5,232	25,437	30,478	6,741
7	May	23,017	30,057	5,902	22,696	28,545	6,741
8	Jun	21,179	28,810	6,512	22,696	29,601	6,741
9	Jul				22,696	28,545	6,741
10	Aug				22,696	28,545	6,741
11	Sep				22,696	28,545	6,741
12	Oct				22,696	28,545	6,741
13	Nov				22,696	28,545	6,741
14	Dec				27,752	30,230	6,741
15	Cumulative	146,119	179,633	29,520	284,573	353,013	80,892
16							
17							
18							
19	The Criteria for the Extract menu command						
20		Task 2 Actual	Task 3 Actual	Task 4 Actual	Task 2 Budget	Task 3 Budget	Task 4 Budget
21							

date as CURRENT_DATE. Then I enter the following formula in the Refers To part of the Define Name dialog box for the name ACTUALS:

=ACS2\$;INDEX(\$ACS2:\$ACS13,
MATCH(CURRENT_DATE,DATES,1))

This formula defines the name as the range of cells from the first date to the current

date. A similar formula, using column AD instead of AC, defines the name BUDGETS.

The series formula that plots the actual expense amounts looks like this:

=SERIES("Actual",Expenses!DATES,
Expenses!ACTUALS,2)

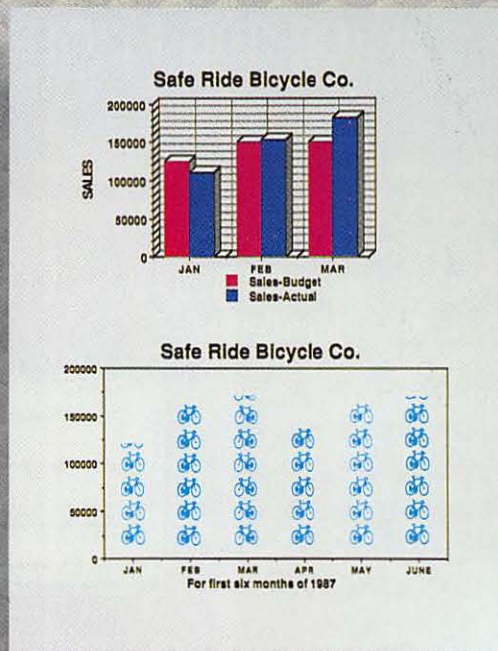
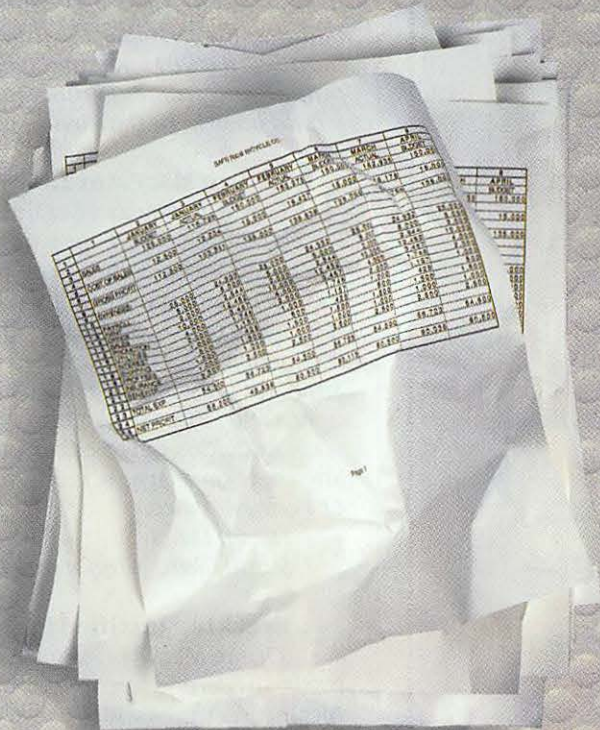
A similar series formula plots budgeted amounts. While entering a series formula, you can insert a name from a worksheet by

(continues)

One Chart for All Seasons

This Excel chart graphs budgeted and actual expenses for any task in a large project, from the first month to the current month. Changing tasks or ending with a different month does not require changing any formulas on the worksheet or the chart. Excel determines the exact range to be graphed from named cell references in the chart's series formulas; the names are defined in the worksheet using the Index and Match functions.

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How To/Quick Tips

showing the worksheet and using the Paste Name menu command. See page 161 in the Excel user's guide for more information on series formulas.

Jack Burke
Austin, Texas

You can avoid having to redefine the CURRENT_DATE name every month by replacing it in your name-defining formulas with Excel's NOW() function. And if you want to index text values instead of dates (for example, the names of the months), the last term in the Match function in your name-defining formulas would have to be 0 instead of 1.

Instant MacPaint 2.0 Tools

Tip: With any tool but the text tool selected in MacPaint 2.0, pressing the *t* key places the Tool palette's close box under the hot spot of the currently selected tool. If the Tool palette is already open (torn off the menu bar), pressing the *t* key closes it. Similarly, pressing the *p* key alternately opens and closes the Pattern palette. Thus you can quickly get to either palette from anywhere on a large screen by pressing *p* or *t* once or twice.

Steven Leach
Santa Clara, California

Breaking Justified Paragraphs

Tip: In MacWrite, a manual page break always ends a paragraph. This technicality interferes with breaking a fully justified paragraph at the bottom of a page. The last line on the page becomes left-justified as soon as you insert the page break. To work around this problem, type hard spaces by pressing Option-spacebar from the end of the prospective last line well into the next line. Then insert the page break after the hard spaces. If the hard spaces don't keep the last line fully justified, add more of them.

Mike Kent
Indianapolis, Indiana

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At any point along the way, the Slide Sorter feature lets you view slides one by one or scan your entire presentation at a glance, or simply rearrange the order with a point and click.

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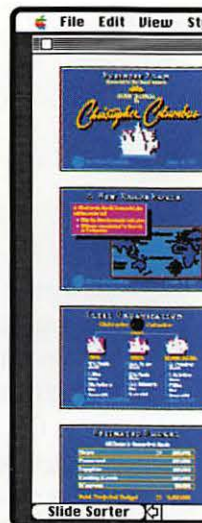
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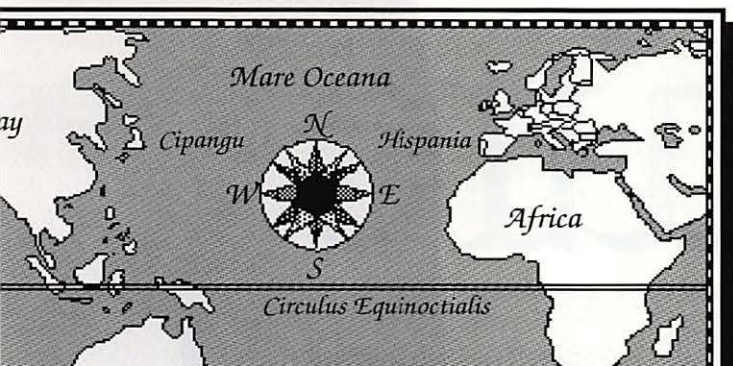
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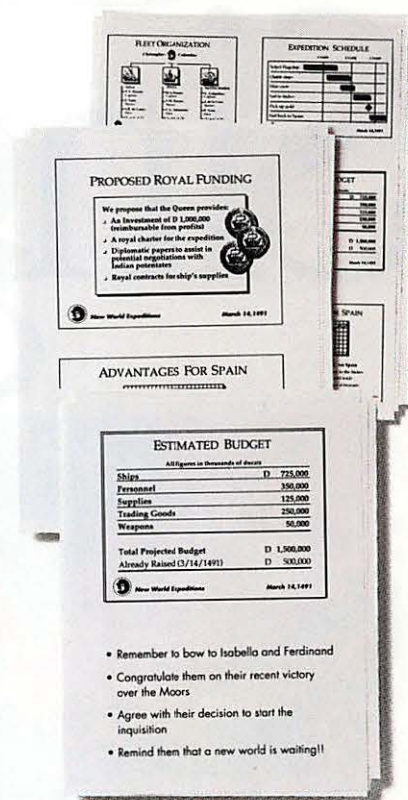
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- Shorter, therefore faster and safer
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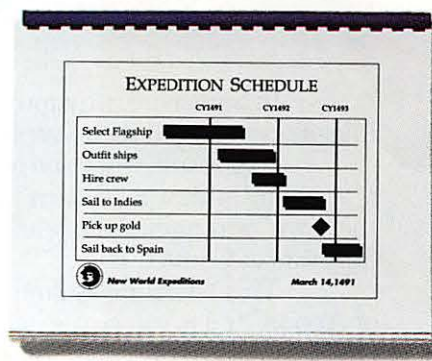


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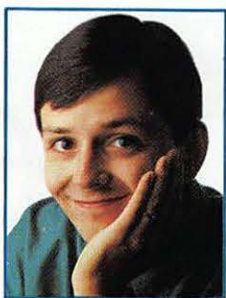
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Getting Started with Data Exchange

From file formats and ASCII to delimiters and networks, a guide to swapping data

by Jim Heid

I live in rural New England, where there's a too-often-told joke about a lost tourist who asks a taciturn Yankee for directions. Never looking up from his checkerboard, the Yankee retorts, "You can't get theyah from heeah."

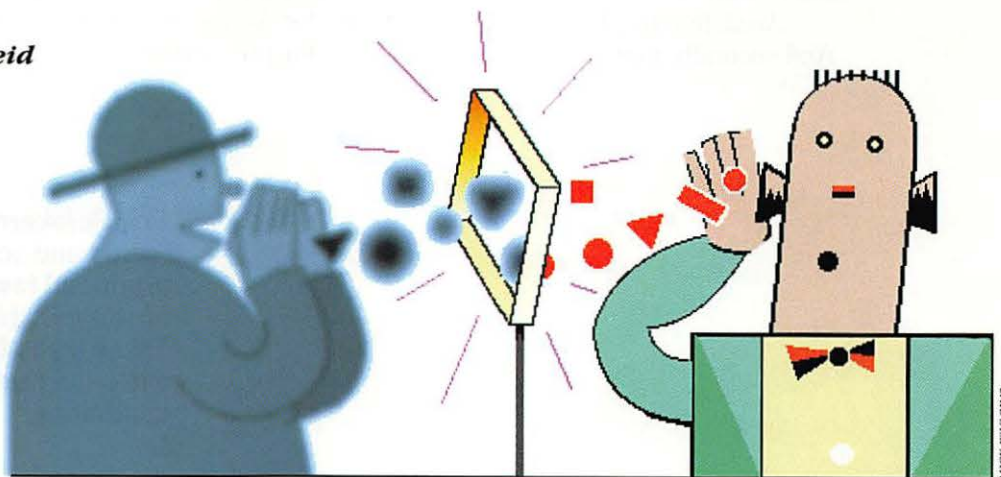
If you've ever struggled to get data from one program or computer to another, you might wonder if that old Yankee's remark applies to computers, too. Perhaps you're trying to transfer a spreadsheet created on an IBM PC to the Mac. Or you want to transfer some in-flight notes from a laptop computer to your Mac for editing. Or maybe you need to move data between Mac programs—perhaps import a Microsoft Works client list into dBase Mac.

Well, your data *can* get there from here. Moving files between programs and computers isn't as easy as using the Clipboard—the Macintosh's small-scale data-exchange medium—but it isn't as hard as finding an obscure New Hampshire hamlet, either. This month we examine data-exchange basics and look at ways to transfer files between programs and computers.

Just between Programs

In an ideal world, exchanging files between programs would be easy because all applications would create and save the same kind of documents. Alas, that world doesn't exist—at least not yet. That's be-

Jim Heid is a Macworld contributing editor who focuses each month on a different aspect of Mac fundamentals.



cause every application category—word processor, spreadsheet, graphics program—has its own document-storage requirements.

When you choose a program's Save command, the program creates a file on disk and then copies data from the Mac's memory to the disk file. If you're using MacWrite, the data includes the characters you've typed and codes that indicate *character attributes* such as font, style, and size. If you're creating a spreadsheet, the program saves the values and formulas you've entered, as well as information that lets the spreadsheet re-create your column widths and cell formats. MacPaint data includes a series of bits corresponding to the black and white areas of the image. A MacDraw file contains the QuickDraw graphics commands that represent the drawing. And regardless of the document's type, the file contains a *signature*, which describes the file's type and its creator and allows the Finder to open the appropriate application when you double-click the document's icon.

Collectively, the organization of data in a disk file—the characters, their formatting codes, and the file signature—is called a *file format*. You might, for example, describe a document created with Microsoft Word as "saved in Word format."

No standard exists that dictates how a program should store its data. Developers design file formats when they create their programs, and they usually keep the formats secret. That's because the original developer may lose business if a competitor deciphers the format and creates a program that understands it. This lack of *glasnost* in the software business results in the data-exchange headaches that occur when one program can't interpret another's file format.

Headache Remedies

The secret to exchanging data between programs is finding a file format that both programs can understand. And the

(continues)

Look at what you're doing. From the audience's point of view, Your perceptions and opinions are absolutely valid. Pretend you're one of the people in your

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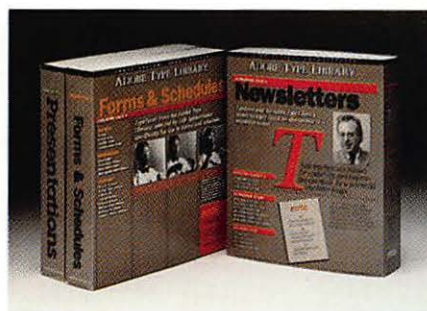
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You've evolved a whole philosophy about forms, haven't you?

More like a mania, I think. Nobody likes forms, you know. We resent them. There's a great prejudice involved. They're inquisitive. They either ask things you don't want to tell, or things you don't know. But we get things from them, don't we? If we fill out an insurance claim correctly, we get money. They also make communication easier. Much easier than writing a letter, for instance. The problem is forms have been abused. The people who make forms only look at them from their own point of view, instead of considering the people who have to use them. But if you want something from somebody, why not make it easy for them to give it to you? That's what a good form does.

How do you go about designing forms and schedules?

It's impossible to go into a great deal of detail, you know, but basically you start by examining the constraints. Is this a form that's going to be generated by a computer, typed on a typewriter, or filled out by hand? And what limitations do each of these methods impose? Does it need to go through the post? Is it oversized? Are there any political restrictions, does the chairman want to have his picture on it, for instance?

Next, you name the elements you need. The paper, number of columns, the print run, any carbon, any locking boxes, tabs, figures, any thing that has to stand out, names, signatures, just cover everything.

Yes, putting the company identity into the most basic printed materials is what you're famous for, isn't it?

(Laughs) Infamous, more likely. Yes, you see, we're a conservative because it's unexpected. If your forms look good, your company

Erik Spiekermann
Erik Spiekermann heads MetaDesign in West Berlin, Germany, and is an internationally recognized authority on typography and design. Widely published in trade journals both here and in Europe. The German Post Office and Herman Miller use his designs. And now, so can you.

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First Impressions

Can a designer who loves good type, good design, and good taste find happiness on a desktop?

So much great design has already been done without computers, what's so terrific about using one?

The enchanting thing about computers is that one person can sit down, write, layout, and print whatever they want whether it's poetry, recipes, a book, or a newsletter. You're in control. Completely. It's also immediate. You can proof and refine and correct things instantly. It's like having your own printing press and type house. In fact, it's not like that at all. That's exactly what you have.

What's the major advantage of desktop publishing?

The interactivity. How many times has a traditional designer marked up type only to have it come back and realize there's something wrong with it and it has to be sent back and another day is gone? On the desktop, you simply do it until you are completely happy.

Tell us your thoughts about the design of this interview page.

This page is a basic 5 column tabloid, but because the body of the article starts in the second column, it makes the page seem more spacious. The large question at the top of the second column (which was set in Franklin Gothic Heavy) centers the eye down to the body of the page, and it leads the reader's eye down to the beginning of the main body of text. The white space between

If there was one typographic design rule to break, what would it be?

There really is no rule that can't be broken. Take the grid for example, you should be able to play with it and not take it too seriously. It's there as a guide, but if you don't ignore it sometimes, everything you do will look boring. Another thing is, there is no such thing as the right typeface, for example, this page may have worked nicely with the answers set in Franklin Gothic Demi. My point is, you have to experiment a lot to get a good solution. That's one of the real strengths of using a computer, you can change type styles instantly and see how the new setting looks.

Are there some tips you'd like to pass along to anyone who is designing a newsletter?

First off, hire a professional (although) keep the copy to a minimum. That'll let you get the type up bigger. The other thing is, people have a limited amount of time to read these days, so you're going to want to make it as desirable and as easy to read as possible. Make the design simple. Try for contrast. Don't average everything out. If you have favorite publications, imitate them. Personally, I think almost anybody can do some design and put out a decent looking document. It doesn't have to be heavily designed, but a document that has been desktop published, if it's been done thoughtfully, is going to command so much more attention. This technology is a force that is going to move everybody up to where we

Roger Black
Former director of editorial art for The New York Times, and chief art director at New York, New West, and Rolling Stone magazines. Redesigning Rolling Stone and Newsweek. Internationally sought after as a publication designer. You should see what he can do for a newsletter.

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Roger Black On Newsletters:
"With these three typeface families, you'll have good contrast, excellent legibility, and a great deal of versatility. In other words, you should be able to do just about anything in a newsletter."

Roger Black
Former director of editorial art for The New York Times, and chief art director at New York, New West, and Rolling Stone magazines. Redesigning Rolling Stone and Newsweek. Internationally sought after as a publication designer. You should see what he can do for a newsletter.

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Format	Application	Pros	Cons
Document content architecture (DCA)	Word processing	Supported by many IBM PC programs and IBM word processors, and by MacLink Plus and Apple File Exchange	Font, style, and size information is lost
Data interchange format (DIF)	Spreadsheets and database management	Supported by many programs and by MacLink Plus	Cell formatting and widths are lost
Encapsulated PostScript (EPS)	PostScript graphics and special effects	Supported by IBM PC version of PageMaker	Applies to PostScript printers only
PICT	Object-oriented graphics	Supported by IBM PC version of PageMaker; translators available for converting to Microsoft Windows graphics	Minimal IBM PC support
Symbolic link (SYLK)	Spreadsheets and database management	Retains some formatting information, including commas, column widths, and cell alignment	Font, style, and size information is lost
Tagged-image file format (TIFF)	Bitmapped graphics	Supported by many IBM PC and Macintosh scanners; not tied to specific computer or graphics resolution	Files can be large and time-consuming to load
Rich-text format (RTF)	Word processing	Retains most formatting information, including font, styles, and sizes; supported by Mac and PC versions of PageMaker	Not supported by most Mac word processors

Common Ground

Some popular data-exchange formats for importing and exporting files created by different applications.

most desirable parcel of common ground is the one that retains the original file's formatting information—its font attributes, row and column widths, cell formats, and so on.

Fortunately, there are some solutions. Some programs become so popular that their formats are deciphered and made public by independent programmers, or they're simply published by the programs' developers. For example, most word processors can open and save MacWrite files, and most paint programs can do the same with MacPaint files. Likewise, many spreadsheet programs can handle Lotus 1-2-3 spreadsheets.

If you use one program with a known format and have another that can interpret its documents, exchanging files between the two is easy. You can convert a document from the original application by choosing the second application's Open command, then double-clicking the document's name. Why not simply double-click

the document at the Finder? Because the Finder would attempt to open it in the original application. (If the original application isn't on your disk and you mistakenly double-click the document, you'll get an error message saying, "An application can't be found for this document." Don't believe it: simply start the second application and use its Open command.)

Another way to move a file between programs is to save it in a data-exchange format—a file format designed for *importing* and *exporting* data. Such formats are usually designed by software developers, who publish the formats' specifications for other developers to use. Microsoft's Symbolic Link (SYLK) is a popular exchange format for spreadsheet and database files. Microsoft's Rich Text Format (listed as Interchange format in the Word dialog box) for word processing documents allows you to swap text without losing character-formatting attributes. "Common Ground" lists several popular data-exchange formats.

Even if none of these solutions applies in your case, there's still hope. You can use a file-translation utility such as MacLink

Plus or Apple File Exchange, provided the utility supports the file formats you use (see "Foreign Formats"). If it doesn't, it's time to visit The Last Resort. Standards are rare in computing, but there is one that allows you to exchange data between any two computers. It's the American Standard Code for Information Interchange—ASCII, for short—and it's the lowest common denominator in the world of data exchange.

Nothing but the Text

ASCII (pronounced *ask-ee*) is a set of 255 codes, each representing a letter, number, special character, or *control code* (a machine function such as a tab or carriage return). All computers use the ASCII character set; thus, they can exchange text and rudimentary formatting (tabs and carriage returns).

Most programs (except graphics programs) can save and open files containing only ASCII code. In the Macintosh world,

(continues)

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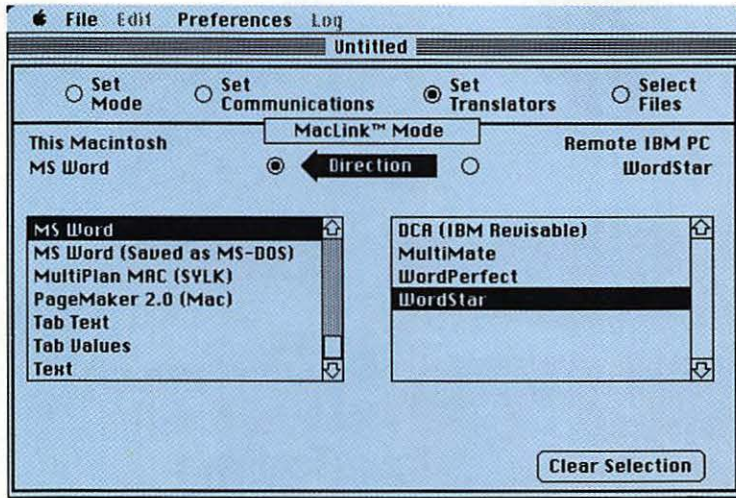
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such files are frequently referred to as *text-only*. Saving a document as a text-only file eliminates its formatting information, but at least you can transfer the text to another program.

Before you convert a document to text-only format, be sure you've saved it in its native file format. Next, choose the application's Save As command and select the text-only option (see "Four Keys to ASCII"). Give the text-only file a different

name to avoid replacing the original. Avoid editing at this point, since any changes you make won't be saved in the original formatted document. For this reason, it's best not to create a text-only file until you're ready to open the file with the importing application.

(Incidentally, MacWrite and WordPerfect require an extra step when saving text-only files. You must specify whether a carriage return should be put at the end of each line or only between paragraphs. If

Foreign Formats

DataViz's MacLink Plus is a file-translation utility that lets you exchange files between Mac and IBM PC applications. Here the program has been set up to translate a WordStar file on the PC into a Microsoft Word file on the Mac.

you plan to open the document with a word processor or desktop publishing program, choose Paragraphs. Choosing Line Breaks will defeat the importing program's word wrap feature, making reformatting difficult.)

The steps required to open a text-only file in the importing application depend on the program. With most word processors and spreadsheets, you can simply use the Open command. If you haven't yet started the application, you can open it and the document by selecting both at the Finder (click on one icon, then Shift-click on the other) and choosing Open from the File menu. This second technique doesn't work with all applications, however. Microsoft Works, for example, displays an error message and tells you to use its Open command's Import File option.

With publishing programs, you usually import text-only files using a Place or Get Text command. Most programs assign preset font, style, and size values to unformatted ASCII text, so you may want to adjust those presets before opening the file (check the formatting section of your program's manual for such features).

(continues)

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
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Scanner	<input type="radio"/> j.	<input type="radio"/> k.	<input type="radio"/> l.
Laser printer	<input type="radio"/> m.	<input type="radio"/> n.	<input type="radio"/> o.
AppleTalk or compatible	<input type="radio"/> p.	<input type="radio"/> q.	<input type="radio"/> r.
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How To/Getting Started

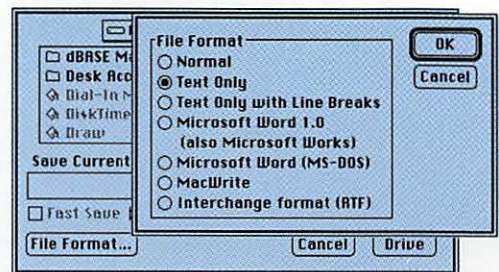
Boundaries for Bytes

If you need to exchange a spreadsheet or a database file, use the exporting program's Save As or Export command to create a file in a format the importing program can interpret. If both programs support an exchange format such as SYLK, use it. Advanced data managers like dBase Mac, 4th Dimension, or Double Helix offer many ways to exchange data. With dBase Mac, for example, you can enter data to and retrieve it from ASCII files directly, or you can use the Print to Disk command to create an ASCII file containing records that appear in a given report.

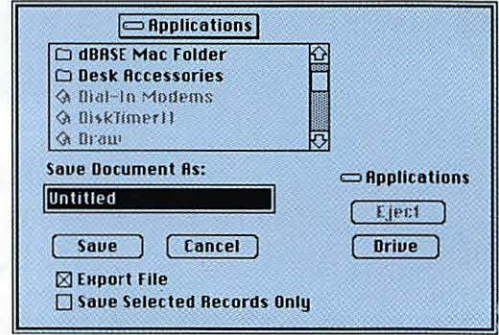
If you must resort to the lowly ASCII format, you'll encounter an additional data-exchange wrinkle. In order to separate the rows and columns of a spreadsheet or the fields and records of a database, the program must insert codes called *delimiters*, which serve as boundaries; they tell the importing program where one field or cell ends and the next begins.

The most common field or cell delimiter is a tab character (ASCII code 9); the most common row or record delimiter is a carriage return (ASCII code 13). A *tab-delimited text file* is an ASCII file whose data items (cells or fields) are delimited by tabs. Some programs and programming languages (such as Microsoft BASIC) use commas as delimiters. Commas cause problems, however, since they can appear within the values themselves ("10,000", "Raynak, Margaret"). Programs that delimit with commas will do what I did in parentheses: enclose each data item with quotes, and then separate each quoted item with a comma.

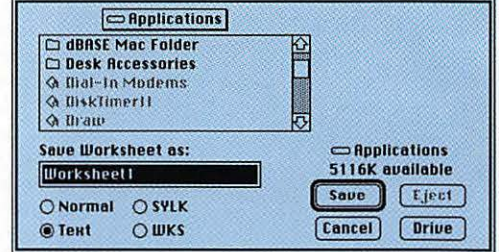
If you're working with programs that don't support the same delimited format, don't give up. You can massage the exported file using a word processor, changing the exported file's delimiters into ones the importing application understands. For example, to format a comma-delimited text file for importing into Microsoft Works' database (which can import tab-delimited text files), open the text file in your word processor and use its search-and-replace feature to replace the quotes and comma delimiters with tab characters. You can use Microsoft Word, WriteNow, FullWrite, or WordPerfect (but not MacWrite) to perform the alterations by specifying tab codes in their search-and-replace dialog boxes.



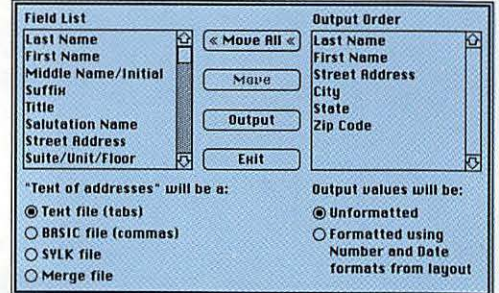
(A)



(B)



(C)



(D)

Four Keys to ASCII

Most Mac applications let you save documents in ASCII, or text-only, form. With Microsoft Word (A), choose Save As, then click the File Format button and choose Text Only. With Microsoft Works (B), choose Save As and click the Export File button. With Excel (C), choose Save As and click Text. With FileMaker Plus (D), choose Output To from the File menu, select the fields to be exported, and click the Output button.

(continues)

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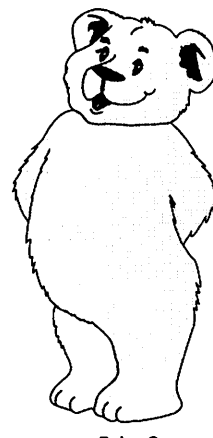
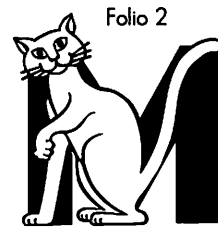
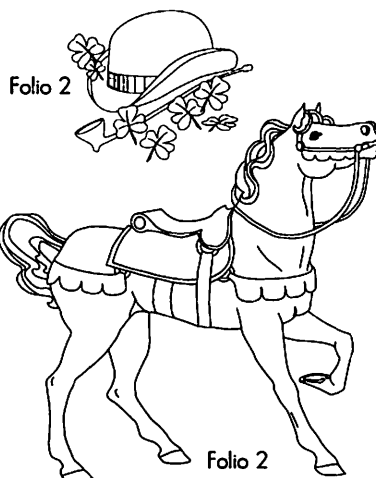
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How To/Getting Started

From One Computer to Another

So far, I've covered exchanging files between Mac programs. Swapping files between computers involves similar hurdles, and to get over them you have to traverse the minefields of telecommunications and networking—the two most common ways to move files between computers. (For more details on Mac-PC transfers, see *Business Clinic, Macworld*, July 1988.)

The communications route involves running a telecommunications program on both computers and using the programs' file-transfer features to send and receive documents. If the two machines are on the same desk, you can connect them with a cable. (An ImageWriter I cable happens to unite the Mac with IBM PCs and several laptop computers, including Tandy's Model 100.) If the machines aren't close enough for a direct link, you must use modems and the phone lines (see "Getting Started with Communications Gear," *Macworld*, May 1987, and "Getting Started with Telecommunications," *Macworld*, April 1987). I've provided some guidelines to get you started in "Computer to Computer."

If you need to swap files with IBM PCs regularly, consider uniting Macs and PCs on a network. Both of the leading Mac network products—AppleShare and TOPS—have PC counterparts, which include AppleTalk expansion boards that plug into PCs, and software that lets PCs access Mac hard disks. With AppleShare, you must dedicate a hard disk-equipped Mac as a *file server*, a central warehouse for documents and applications. TOPS works differently, turning each computer on the network into a file server. (For details, see "Getting Started with Networking," *Macworld*, September 1987.)

Networks enable you to access remote disks as if they were attached directly to your Mac. That makes exchanging files as easy as *mounting* a file-server volume (the equivalent of inserting a disk), and opening the file.

But networks can be expensive and difficult to set up. If you simply need to exchange files with PCs, consider a PC disk drive such as Dayna Communications' DaynaFile (see *Reviews, Macworld*, February 1988). The DaynaFile attaches to a Mac's SCSI port and can house one or two 5¼-

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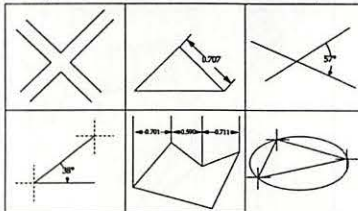
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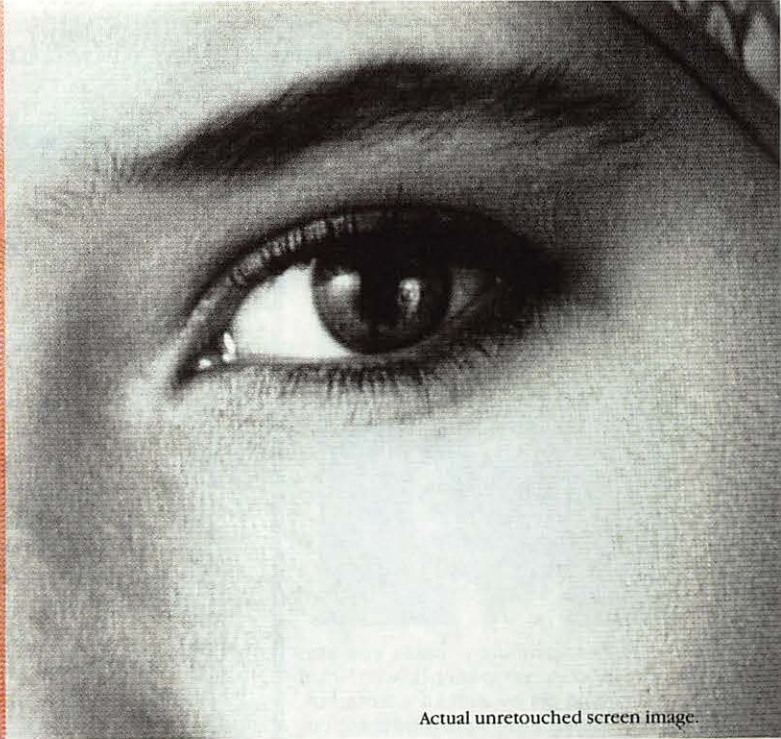
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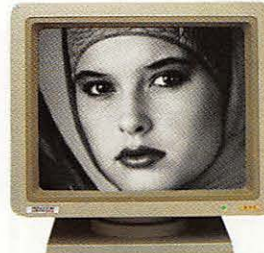
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How To/Getting Started

Computer to Computer

Here are some tips for using a communications program to transfer files between computers:

- If you're using a direct (machine-to-machine) connection, make sure your dealer gives you the right cable and that it's properly wired. Standard RS-232C cables won't work; the cable must be wired as a *null modem*, which tricks each machine into thinking it's talking to a modem.

- Make sure the receiving and transmitting programs are speaking the same language at the same speed, or *baud rate*. Typical settings for cable connections are 9600 baud, 8 data bits, 1 stop bit, and no parity. For 1200-bits-per-second (bps) modems, use 1200 baud instead of 9600. And to see what

you're typing, turn on both programs' local echo options.

- Use transfer protocols, such as Xmodem, to eliminate garbled data by "proofreading" data as it's sent. For Mac-to-Mac transfers, use MacBinary Xmodem; it transfers the special information in Mac files, such as an icon's appearance.

- Before starting a modem transfer, the sender and receiver should match their communications settings and transfer protocols, and decide who will call whom. If you're at the receiving end, put your program in *answer mode* (if you're the sender, invoke your program's *dial* command). Once you've made a connection, type a few characters to verify settings, then invoke the transfer commands.

inch or 3½-inch floppy drives, or one of each. You simply pop a PC floppy disk into the drive, and its contents appear on the Mac's desktop. Dayna sells its own version of MacLink Plus, which handles most PC formats, but the DaynaFile also supports Apple File Exchange.

Another way to shuttle bytes is through Compatible Systems' QuickShare. The package includes an expansion board that adds a SCSI port to a PC, and PC and Mac software for transferring files over a SCSI cable and for storing Mac files on a PC's hard disk. QuickShare also includes a clever translation program that retains most of a PC file's formatting information.

Of course, with networks and other sharing devices, the golden rule of data swapping still applies: If the exporting and importing applications don't share a common file format, you must use a file-translation utility or resort to an ASCII file to transfer only the text. If you anticipate frequent Mac-PC swapping, you can minimize migraines by using programs that share formats. Microsoft Word, Excel, WordPerfect, and PageMaker each share formats with their PC counterparts.

Closing the Exchange

Of course, the easiest way to translate files is to let someone else do it. CompuData Translators (800/825-8251 or in California, 213/462-6222) specializes in industrial-strength file conversions, such as translating reams of legal documents stored on obsolete paper tape into Microsoft Word files. CompuData claims to translate between micros, minis, mainframes, dedicated word processors, typesetters—you name it. You might say it has redefined delimits of file-conversion.

Then again, you might not. File conversion can be a grueling job that dulls your appetite for puns. Just remember: the format's the thing. If the two swapping programs don't share a common format, use a file-translation program. If you strike out there, use an ASCII file. You'll have to do some reformatting, but you'll be spared retyping. And in the end, never having to type the same text twice is what data exchange is all about. □

See *Where to Buy* for contact information.

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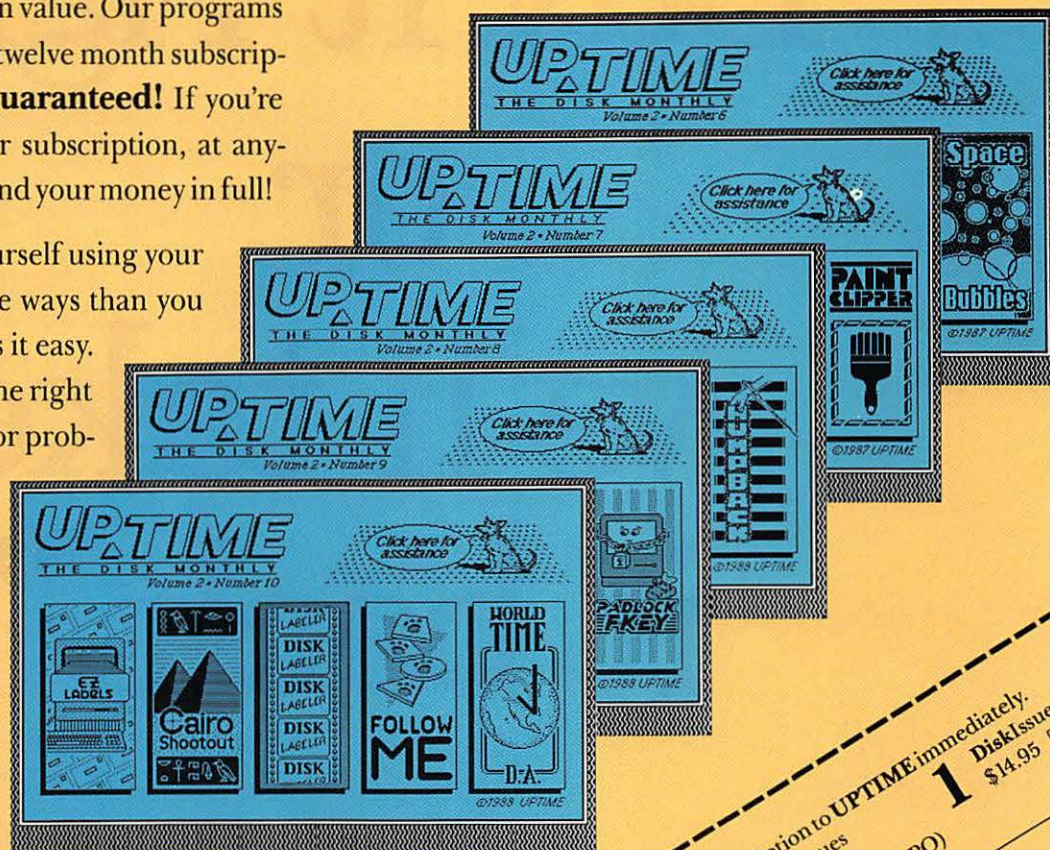
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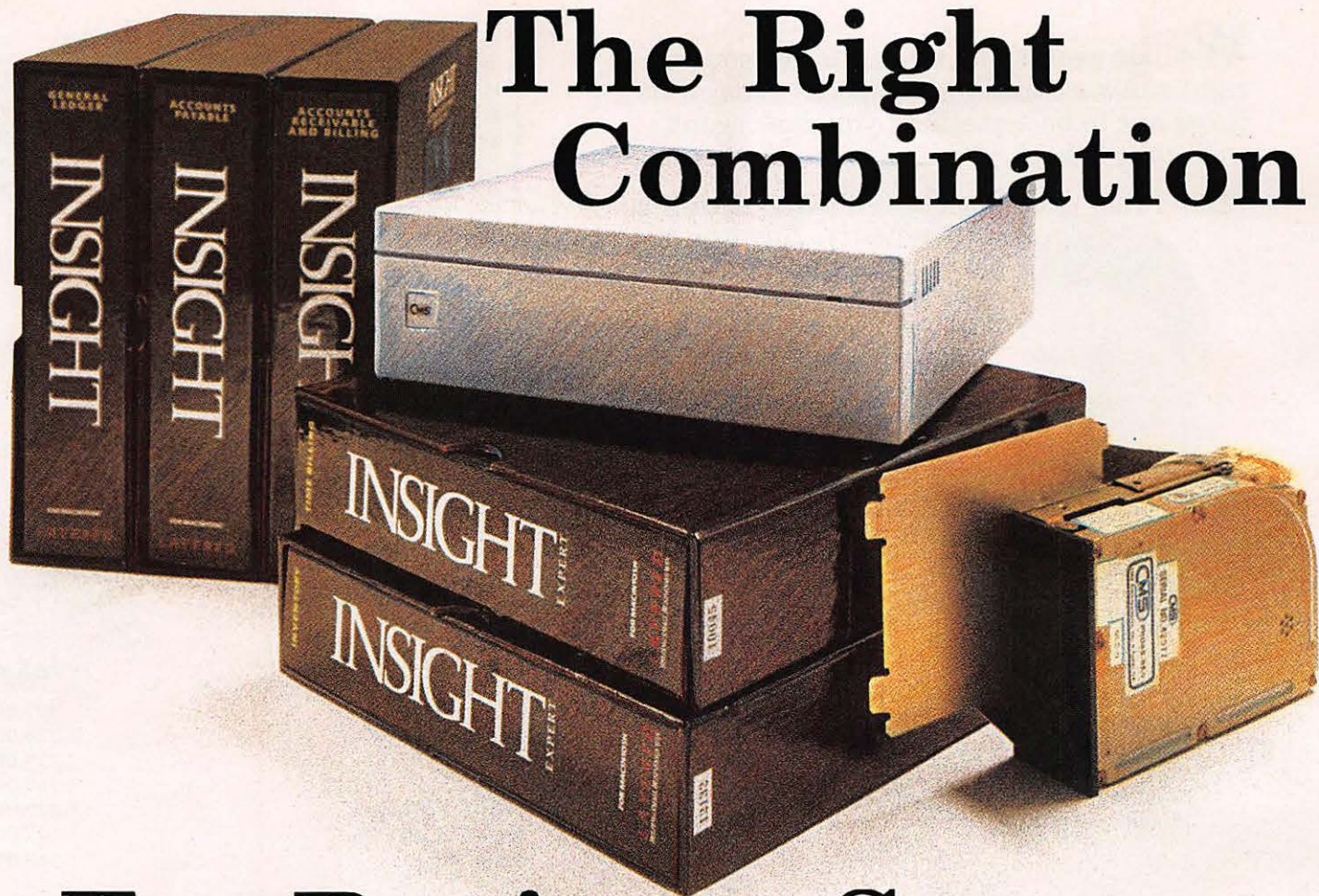
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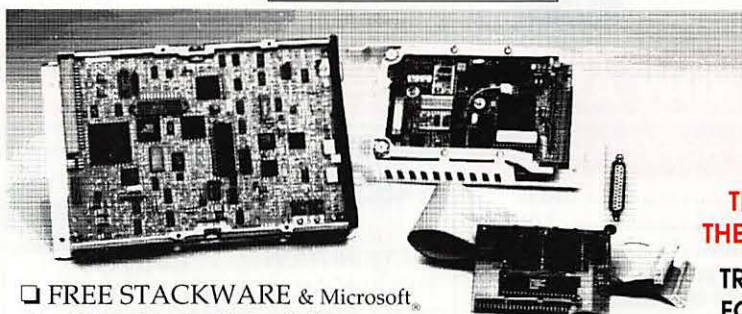
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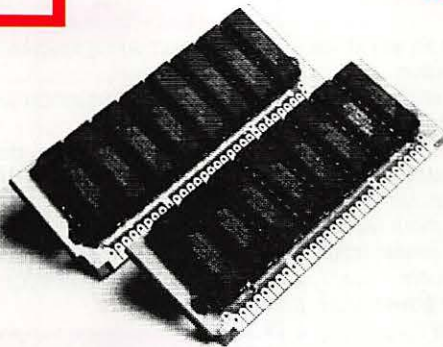
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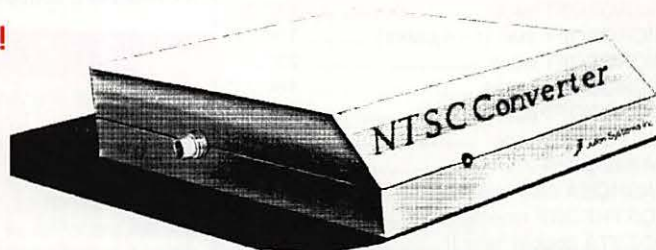
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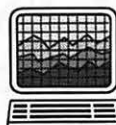
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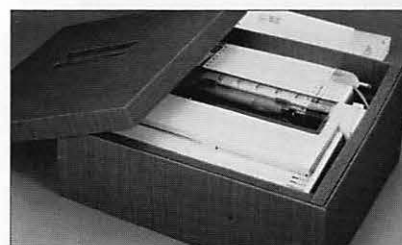
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Insights on dBase Mac

From navigation to file relations, hints for conquering Ashton-Tate's relational database manager

by Jim Heid and Dennis Cohen

Three years in the making, Ashton-Tate's dBase Mac took longer to complete than most Hollywood epics. But many people seem to think its mix of power, performance, and relative ease of use was worth waiting for.

No relational database is a picnic to learn, however, and you might dispute the ease-of-use claim if you've puzzled over dBase Mac's flashy but flimsy documentation. To help fill the gap, we've collected some hints and tips to improve this product's performance.

The dBasics

Mastering dBase Mac requires understanding its division-of-labor approach to data management. Three components work together in dBase Mac: datafiles, views, and projects.

A dBase Mac *datafile* holds information about each field as well as the data itself. A datafile does *not* tell dBase Mac how to present data on screen or how to print it; for those tasks you use *views* or windows to a datafile's contents. The Quick Create feature whips up quick-and-dirty views for data entry or browsing. Or, you can use dBase Mac's layout features to design views that mimic paper forms.

A *project* stores view designs and information needed to work with datafiles, but not the datafiles themselves. This approach lets you use the same datafiles (and therefore the same data) in any number of projects. The project tells dBase Mac which datafiles are required.

Dennis Cohen is a member of Ashton-Tate's dBase Mac development team. Jim Heid is a Macworld contributing editor. Portions of this article were adapted from his book dBase Mac in Business, ©1987 by Ashton-Tate Publishing. Used by permission.



ROBERT HOLMGREN

Standup comedian Sinbad uses dBase Mac to keep track of everything from his jokes to his gigs. Sinbad takes his Mac with him on the road, here on stage in Las Vegas.

Getting Around Faster

dBase Mac provides many shortcuts for quick navigation. Besides using scroll bars to view the contents of a window, you can use the "Option-drag" technique: press the Option key and drag the cursor within the view window. The pointer assumes a hand shape, and the view goes by like a roll of paper.

A clever keyboard shortcut lets you change numerous field definitions quickly. When you press the Option key with the Change Field dialog box open, the Done and Cancel buttons change to Done/P and Cancel/P, where *P* stands for *prior*. Press \mathbb{H} , and the buttons read Done/N and Cancel/N (for *next*). Clicking the Done/P button registers your changes to the current field's definition and then displays the pri-

or field's characteristics; Done/N records the changes and moves on to the next field in the datafile. The Cancel/P and Cancel/N buttons discard changes to the current field and then display the prior or next field, respectively. These techniques eliminate having to repeatedly return to the Structure window to select the next field.

You can also answer Yes, No, or Cancel to dialog boxes from the keyboard. For example, when you choose Quit after changing a project, dBase Mac asks if your changes should be saved. Instead of reaching for the mouse, just type *Y* to answer yes, *N* for no, or *C* for cancel.

Like many Mac programs, dBase Mac provides double-click shortcuts to avoid side trips to menus and buttons (see "Double Duty"). And don't neglect the palette: clicking its icons is faster than choosing

(continues)

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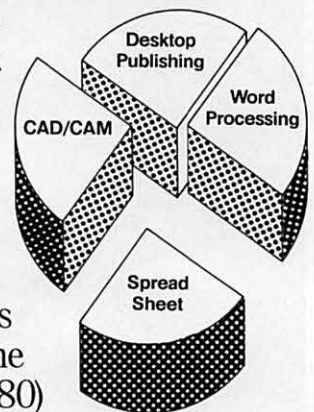
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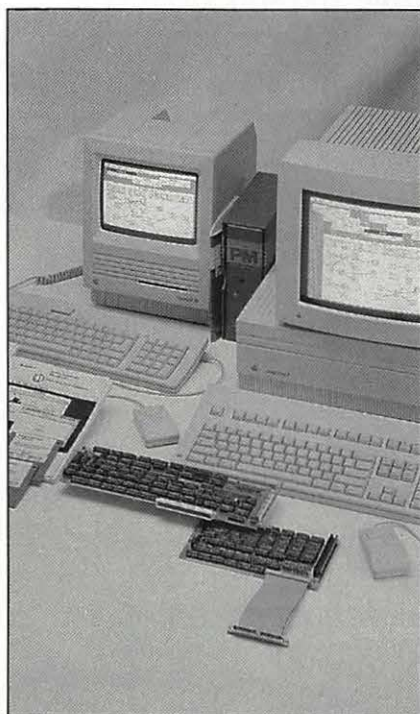
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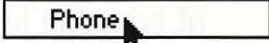
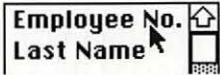
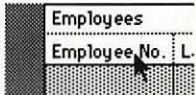
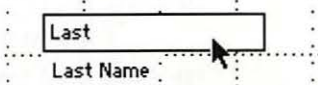
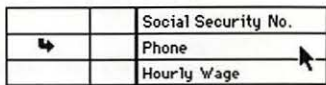
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How To/Insights

Double Duty

Six ways to save time in dBase Mac by double-clicking

	To ...	Double-click on ...
	change a datafile	its title bar in the Structure window
	change a field	the field in the Structure window
	add a field to the hierarchy	the field name in the Fields list box
	change a view field	the field in the view hierarchy
	change the display options of a form element	the element
	change the update action of a field in a transfer view	the multivalued destination field

commands from menus. Remember, too, that you can customize the palette for maximum efficiency by adding or removing icons and by changing their appearance.

Choices, Choices

You can speed data entry and avoid repetitive typing by setting up a checklist (in the form of buttons or a pop-up menu) instead of leaving a blank field to be filled in. For example, a bookstore manager might want a Category field that displays five choices: Fiction, Nonfiction, Reference, Business, and Tacky Romance.

If you want to change a Category's list of choices, there's an important point that dBase Mac's documentation fails to mention: Don't change the order of the list—add choices only at the *end* of the list. Why? Because when you make a multiple-choice selection during data entry, dBase Mac records not the name of your choice (Fiction, Nonfiction, and so on) but a number corresponding to its position in the list. Adding a new choice (say, Cookbooks) to the beginning of the list would bump all remaining choices down. Your datafile would become a jumble of apples and or-

anges as you add new records: cookbook titles you enter would be grouped with fiction from existing records, and new business books would be mistakenly added to the Tacky Romance roster—a classification few authors would appreciate.

Multivalued Fields: A Caution

The multivalued field can hold many discrete values in each record, which can be very handy. For instance, you can use a multivalued field named Phone to store both home and work numbers. But it's easy to abuse the flexibility of this type of field. Just because the program provides multivalued fields doesn't mean you should use them whenever a field can contain multiple values.

Consider a database that creates invoices. Many people think a multivalued field is a natural for holding an invoice's line items, but that type of field can slow performance—and it limits your options for expanding the scope of the database.

(continues)

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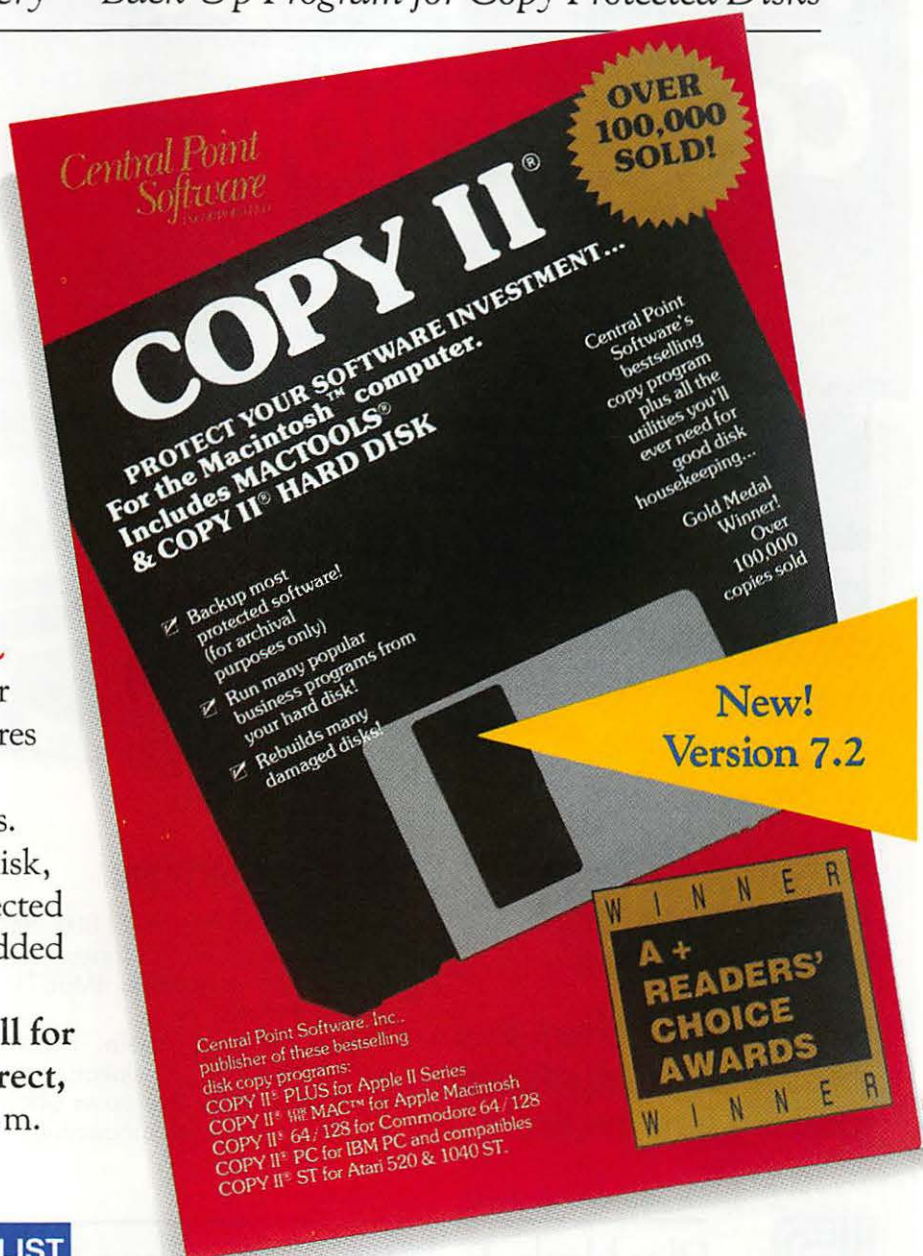
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How To/Insights

Instead, create a separate datafile for all the products you carry, including current prices and brief descriptions for the invoice. Establish a file relationship to the invoice file and then type in a predefined code and quantity for each product as you fill out the invoices and let the program fill in the description and the cost. This approach also gives you the option of later extending the project to automatically update the inventory records based on the transactions.

Always look twice at the data and how you plan to use it before defining it as a multivalued field. If you may want to use the data in another way—in another project or file, for example—store it in separate files rather than in a multivalued field.

Toward Hotter Hierarchies

You can control performance by carefully crafting your view hierarchies. The hierarchy drives dBase Mac's data retrieval; if a view's hierarchy contains extraneous fields, dBase Mac extracts information unnecessarily. The resulting slowdown is most apparent in transfer views and columnar display views, since they deal with multiple records. To bypass unnecessary information, don't put fields in the hierarchy if they don't appear on the data entry form or if they aren't referenced in formulas, in sorts or selection criteria, or in breaks and totals.

Faster Forms through Graphics

If you're creating a form with a complex layout, don't use dBase Mac's layout features. Instead, create the form using a drawing program such as MacDraw or Cricket Draw, then bring it into dBase Mac. This technique offers the advantage of lightning-fast screen updates and slightly faster response to your mouse clicks, not to mention graphic effects (such as rotated text and hairline rules) unavailable with dBase Mac alone. Here's how:

1. In the drawing program, select the form, copy it, and paste it into the Scrapbook.
2. In dBase Mac, set Preferences to specify no fill pattern, an invisible pen (the dotted-line button), and no titles.
3. Activate the dBase Mac view that will contain the form and choose Layout View from the View menu.

(continues)

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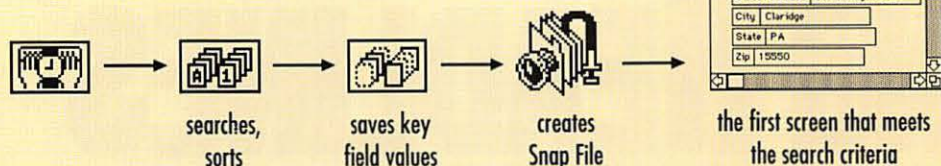
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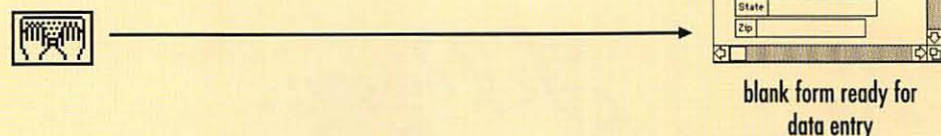
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Perform and Use View



Use View



Two Views

The diagram shows how much more dBase Mac does when you choose its Perform and Use View command. With a large database, "performing" a view may be time-consuming (hence the wristwatch on the command's icon); therefore, select Use View when your main activity is data entry.

4. Create a fixed graphic element the size of the form and then paste the form drawing into the fixed graphic element.

5. Drag the fields into position and size them as needed.

How to Perform a View

After you design a view, you employ it by choosing either the Use View command or the Perform and Use View command. Sound confusing? Just keep in mind that these similar-sounding commands have significant differences.

When you *perform* a view, dBase Mac creates a temporary work file (called a snap file), which contains all the key-field values that identify the records and allow the program to retrieve and display them quickly. Conversely, when you *use* a view, dBase Mac doesn't build a complete snap file, but simply shows blank data display items and empty columnar items (see "Two Views").

When your main activity is entering new data, choose the Use View command. When your main activity is retrieving records—especially in columnar form—

(continues)

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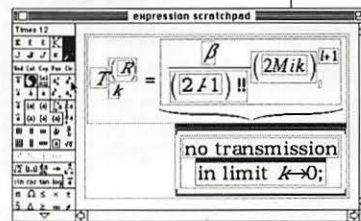
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```
{field name•file name} = UPPER({field name•file name})
REDISPLAY({field name•file name})
ACCEPT
```

Uppercase Converter

This procedure converts the text you enter into uppercase characters, eliminating the need to press Shift during data entry and ensuring accurate sorting. It's especially useful for a field containing state name abbreviations.

```
DIALOG 80,120,265,430

BUTTON 1,145,110,165,190,"OK"

BUTTON 2,145,210,165,280,"Cancel"

FIXEDTEXT 10,10,80,300,"Only authorized personnel can access
this form. Enter your password and click OK; otherwise, click
Cancel."

EDITTEXT 1,90,75,105,200,dummy
END
typed_password = TEXTVALUE(1)
IF BUTTONVALUE(2) THEN

EXIT
END
\ Note: replace the "password" below with your password \
IF typed_password ≠ "password" THEN

ALERT("Sorry, incorrect password.",STOP)

EXIT
END
```

Password Procedure

This procedure asks for a password before opening the view. When entering the procedure, in the fourth line from the bottom substitute your choice for the placeholder "password," but leave the quotes intact.

```
DIALOG 60,110,185,400

BUTTON 1,80,40,100,120,"Yes"

BUTTON 2,80,150,100,230,"No"

FIXEDTEXT 20,20,60,275,"You can't undo a deletion. Do you
really want to delete this record?"
END
IF BUTTONVALUE(1) THEN

DELETE (SELF)
END
```

Delete Verification

When attached to a file, this procedure displays a dialog box that prevents users from inadvertently discarding records.

choose Perform and Use View. Remember this: *perform* shows data; *use* displays the data entry form.

Data Display Shortcuts

Sometimes the task at hand calls for including a table of data on the data entry form rather than individual fields. Two undocumented shortcuts simplify the work of making these columnar elements fit the form or view window.

To create an element that fits within the view window's current width, press Option while dragging the field selection from the hierarchy to the drawing area. To create a columnar element to match the current form width, press Caps Lock, then press Option and drag the fields into the drawing area.

With a view containing only one columnar element, you can resize the window to enclose just that element and then hide the window's scroll bars for a tidier look. To hide the scroll bars, start by choosing Layout View, and then choose Hide Scroll Bars from the Design menu.

For speed, use columnar views judiciously. When you choose Columnar Layout from the View Type pop-up (in the New View dialog box), dBase Mac creates a full-page columnar display item. When you perform the view, dBase Mac retrieves all the records that will fit in the display item—even if they won't appear on screen. Therefore, for the sake of efficiency, don't select a columnar layout unless you plan to use all that data—for example, to print a full-page columnar report or to view a full-page screen. For browsing data in columnar form, create a custom view with a columnar element whose height matches the window's.

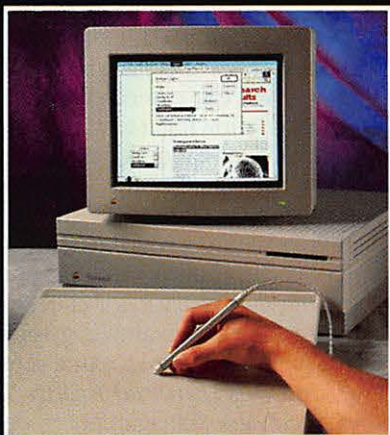
Procedural Potpourri

dBase Mac lets you attach command sequences called *procedures* to fields, views, and files. Procedures are the keys to dBase Mac's application-development features, allowing you to create custom dialog boxes, entry-checking routines, and more. Here are some procedures you can add to your projects.

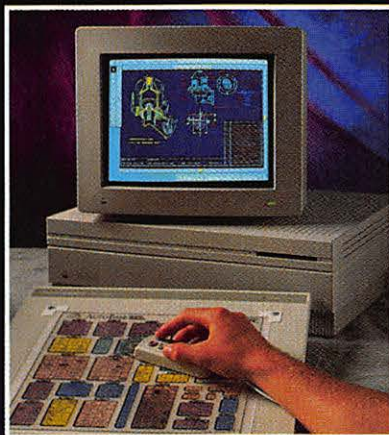
The procedure in "Uppercase Converter" uses the Upper text function to convert the text in a field to all uppercase letters—a useful function for a field containing state name abbreviations. To add the procedure to a field, double-click the field in the hierarchy, click the Show Pro-

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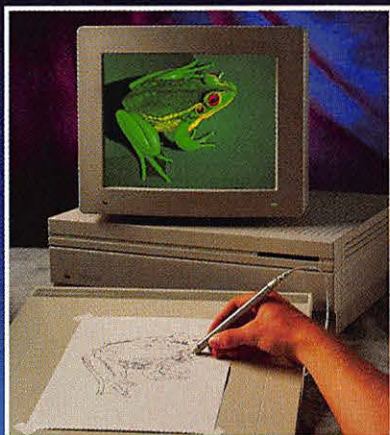
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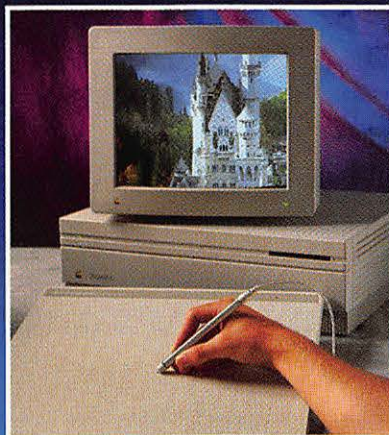
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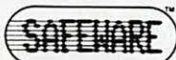
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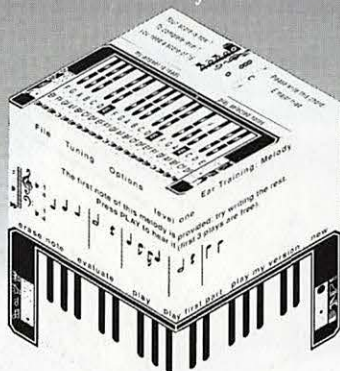


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How To/Insights

cedure button, choose Post-processor, and enter the procedure.

The slightly longer procedure shown in "Password Procedure" lets you guard against unauthorized view access. To attach this preprocessor procedure to a view, first choose Define Hierarchy from the View window, click Show View Procedure in the view's hierarchy window, and then enter the procedure. Thereafter, when you choose the view's name from the Windows menu or from a custom menu, dBase Mac asks for a password before opening the view.

When you use dBase Mac's Delete command, deletion occurs immediately—and irrevocably. The procedure in "Delete Verification" adds a dialog box that requires the user to confirm or cancel the deletion. To attach the procedure to a file, start by activating the Structure window,

double-click the file's title bar, click Show Procedure in the subsequent dialog box, choose Delete Record from the Type pop-up, and enter the procedure.

Advanced application developers can access external code procedures using dBase Mac's Call statement. External code resources can extend dBase Mac's capabilities, allowing it to access data from a bar-code reader, for example. Extensions can also be used to perform time-consuming operations quickly, as in "Numbers to Text," a routine in MPW Pascal. It converts numeric values to English text strings—a vital job for check-printing applications. For example, given the numeric sequence 123, the routine returns the text string *One Hundred Twenty-Three*. In the Checkbook Management System that ac-

(continues)

```
#Call2.bld
#The following commands will build the Digit2String CALL resource as CALL 2

#First we compile it
Pascal NumToStr.p

#Then we link it, note the collection of segments and the renaming thereof
Link -rt CALL=2 0
-m DIG2STR 0
-sn Main=DIG2STR,Main 0
-sg Main="DIG2STR" 0
-o DigitString 0
NumToStr.p.o {PLibraries}PasLib.o {Libraries}Interface.o

#Correct the path of the output to match that for your system.
rez "NumToStr.r" -o "DRC80:dBASEfldr:dBASE Mac Resource"

-----
NumToStr.r

include "DigitString" 'CALL' (2) AS 'CALL' (2, "Dig2Str", Purgeable);

-----
NumToStr.p

UNIT DigitsToString;
{Dennis R. Cohen - Ashton-Tate - 871015}
INTERFACE

USES
    MemTypes,      {So that Str255 will be known}
    QuickDraw,
    OSIntf,
    ToolIntf,
    PackIntf;      {So that we can get StrToNum}

CONST
    {Call constants}
    numCallParmsMax = 16;
    numCallResrvMax = 18;
    {Call data types}
    CTStringHandle = 1;

TYPEF
    CallParmPointer = ^CallParmBlock;
    CallParmBlock = RECORD
        callPCount:integer;
    Parameter count)
        callPTypes:array [1..numCallParmsMax] of Integer;      { -> Data types of Parameters}
        callParms: array [1..numCallParmsMax] of Handle; { -> Call Parameters}
        callRType:integer;
    Data type of Result)
        callResult:Handle;
    Result)
        callReserved:array[1..numCallResrvMax] of LongInt;
    END;

PROCEDURE Dig2Str(theParms: CallParmPointer);

IMPLEMENTATION
```

(continues)



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How To/Insights

```
{ $$ DIG2STR }
PROCEDURE Dig2Str(theParms: CallParmPointer);
{
  Take a numeric string, srcStr, and return the English equivalent, eg:
  1025 as input would return
  "One Thousand Twenty-Five"
  as the result, outStr.
}
TYPE
  Str10 = String[10];

VAR
  srcStr, outStr: Str255;
  decs, ones, teens: ARRAY [0..9] OF Str10;
  units, tens, hu, th, tt, ht: LongInt;
  aLong: LongInt;

BEGIN
  srcStr := StringHandle(theParms^.callParms[1])^;
  outStr := '';
  ones[0] := 'Zero';      teens[0] := 'Ten';      decs[0] := '';
  ones[1] := 'One';      teens[1] := 'Eleven';    decs[1] := 'Ten';
  ones[2] := 'Two';      teens[2] := 'Twelve';    decs[2] := 'Twenty';
  ones[3] := 'Three';    teens[3] := 'Thirteen';  decs[3] := 'Thirty';
  ones[4] := 'Four';     teens[4] := 'Fourteen';  decs[4] := 'Forty';
  ones[5] := 'Five';     teens[5] := 'Fifteen';   decs[5] := 'Fifty';
  ones[6] := 'Six';      teens[6] := 'Sixteen';   decs[6] := 'Sixty';
  ones[7] := 'Seven';    teens[7] := 'Seventeen'; decs[7] := 'Seventy';
  ones[8] := 'Eight';    teens[8] := 'Eighteen'; decs[8] := 'Eighty';
  ones[9] := 'Nine';     teens[9] := 'Nineteen'; decs[9] := 'Ninety';

  StringToNum(srcStr, aLong);
  outStr := '';
  IF (aLong >= 1000000) | (aLong < 0) THEN outStr := '*****'
  ELSE IF aLong = 0 THEN outStr := 'Zero'
  ELSE BEGIN
    ht := aLong DIV 100000;
    IF ht > 0 THEN outStr := Concat(outStr, ones[ht], ' Hundred ');
    aLong := aLong MOD 100000;
    th := aLong DIV Ord4(1000);
    IF th > 0 THEN BEGIN
      IF (th > 9) & (th < 20) THEN BEGIN
        outStr := Concat(outStr, teens[th-10], ' Thousand ');
      END ELSE BEGIN
        tt := th DIV 10;
        th := th MOD 10;
        IF tt > 0 THEN outStr := Concat(outStr, decs[tt]);
        IF (tt > 0) & (th > 0) THEN
          outStr := Concat(outStr, '-', ones[th]);
        ELSE outStr := Concat(outStr, ones[th]);
        outStr := Concat(outStr, ' Thousand ');
      END
    END ELSE BEGIN
      IF ht > 0 THEN outStr := Concat(outStr, ' Thousand ');
    END;
    aLong := aLong MOD Ord4(1000);
    hu := aLong DIV Ord4(100);
    IF hu > 0 THEN outStr := Concat(outStr, ones[hu], ' Hundred ');
    tens := aLong MOD Ord4(100);
    IF tens > 0 THEN BEGIN
      IF (tens > 9) & (tens < 20) THEN BEGIN
        outStr := Concat(outStr, teens[tens-10]);
      END ELSE IF tens < 10 THEN outStr := Concat(outStr, ones[tens]);
      ELSE BEGIN
        units := tens MOD Ord4(10);
        tens := tens DIV Ord4(10);
        outStr := Concat(outStr, decs[tens]);
        IF (tens > 0) & (units > 0) THEN
          outStr := Concat(outStr, '-', ones[units]);
        ELSE IF units > 0 THEN outStr := Concat(outStr, ones[units]);
      END;
    END;
  END;
  theParms^.callRType := CTStringHandle;
  SetString(StringHandle(theParms^.callResult), outStr);
END {Dig2Str};
END {DigitsToString};
```

Numbers to Text

This MPW Pascal routine converts numeric values to English text strings. You can compile it into an external code resource and access it using dBase Mac's Call statement.

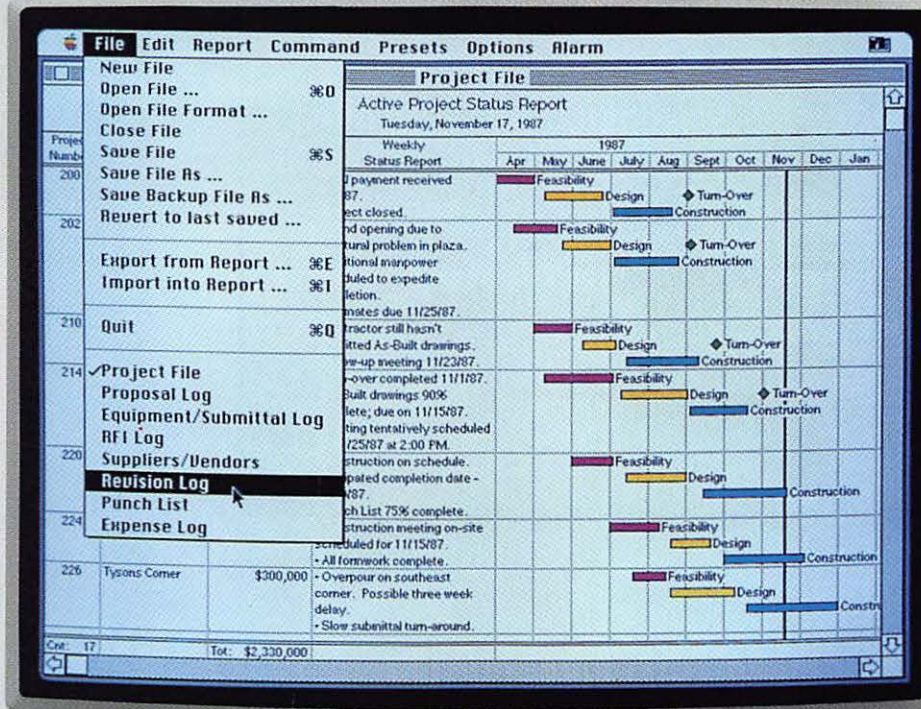
companies dBase Mac, a different procedure performs this job—and takes roughly ten times longer.

dBase Mac 1.01, released last April, includes a standard Call interface to HyperCard external commands (XCMDs) and external functions (XFCNs). You can use XCMDs for special effects, such as having

dBase Mac "speak" values as they're entered, and XFCNs for performing complex calculations in a formula field.

Finally, a word about when *not* to use procedures. Although you can create procedures to check data as it's entered, you'll get better performance from dBase Mac's range-checking and pattern-matching features, which are part of a field's definition. □

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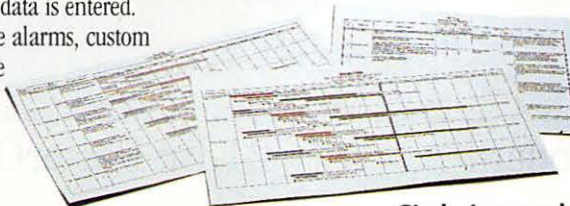
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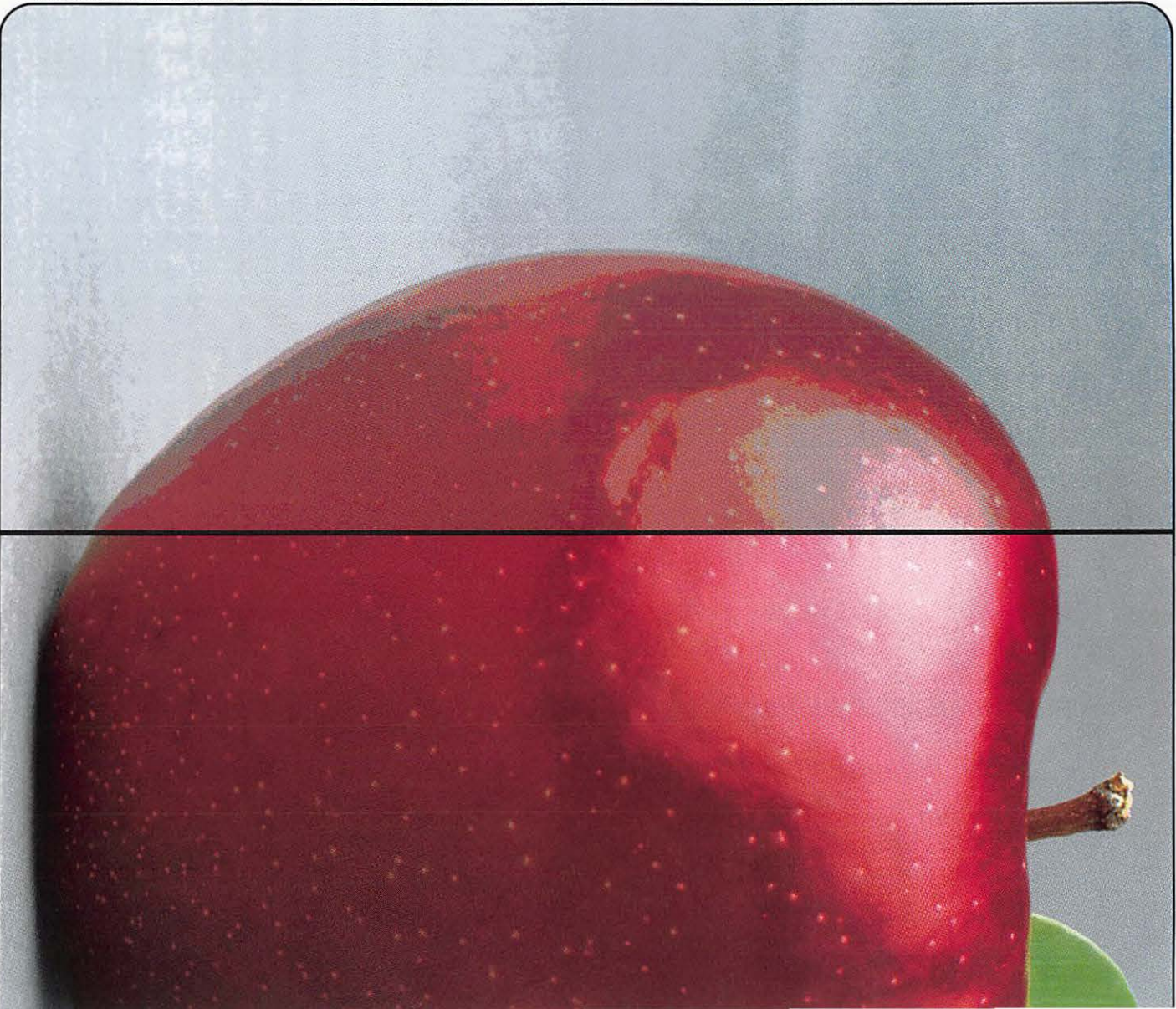
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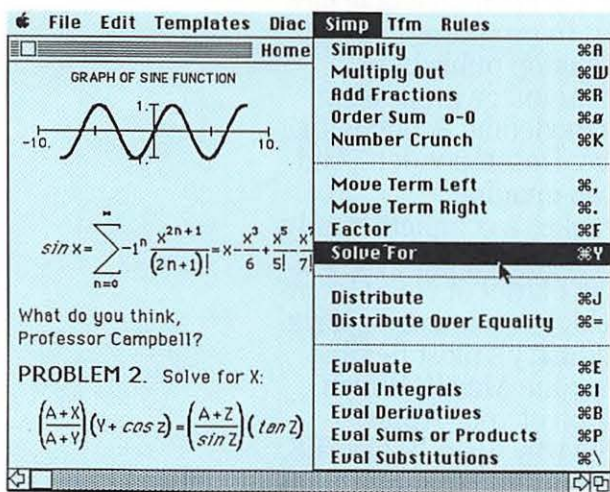
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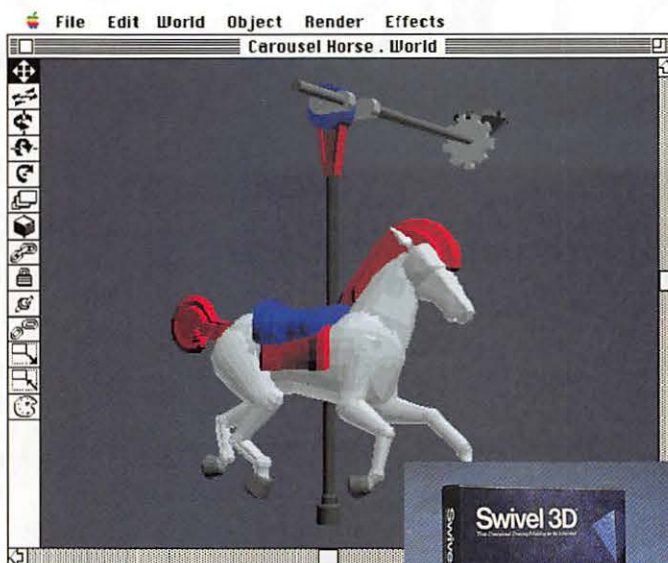
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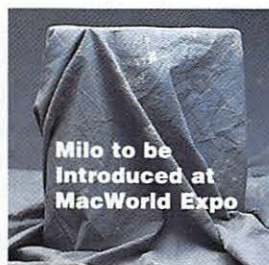
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Mac HyperCard Tools

Add power to your stacks with XCMDs and XFCNs from the public domain

by Frank Ripp

In the bulging HyperCard stack collections of Macintosh user groups you'll find ample evidence that HyperCard has met a need by providing a way for nonprogrammers to design custom Mac software. People who never dreamed they'd learn Mac programming—notoriously difficult even for professionals—are enjoying the satisfaction of controlling their Macs. But while the HyperTalk programming language is relatively forgiving of novice programmers, it does have limitations. That's why authors of HyperTalk made the programming language as customizable as the stacks themselves. They made it an "open" language that can be extended beyond its inherent limits through the use of external commands and functions (XCMDs and XFCNs) written in other programming languages (see "What Are XCMDs and XFCNs?").

This article examines 16 especially handy XCMDs and XFCNs, which are all available free or on a shareware basis (see "Where to Find Stacks").

File-Management Aids

■ **FileName** Steve Maller's **FileName** was one of the first XFCNs and remains one of the most useful around. It puts up a standard Macintosh file selection box, letting you select files on any drive (see "FileName"). It then passes the complete path of that file to your script. Before **FileName** came along, HyperCard required you to type in a file's complete path name

Frank Ripp is a freelance technical writer living in Berkeley, California; he specializes in programming and writing about HyperCard.



Dewey Williams, a professional Mac programmer who lives on the outskirts of Boulder, Colorado, produces HyperCard extensions in the course of his work and then distributes them noncommercially for others to use.

(such as **Hard Disk: My Folder: File x**) to access it. You need to have **FileName** installed to use the XCMDs **DeleteFile** and **RenameFile**.

The short script here shows how you might use **FileName** to select an application and then open it from within your script. Note that the parameter **APPL** causes **FileName** to display applications only. You can also choose to have **FileName** display all files—**FileName()**—text files only—**FileName("TEXT")**—or stacks only—**FileName("STAK")**. The variable **theFile** holds the path name of the file that the user selected.

```
on mouseUp
  put FileName("APPL") into theFile
  if theFile is not empty then open theFile
end if
end mouseUp
```

■ **DeleteFile** Dewey Williams's **DeleteFile** XFCN lets you delete files from within your scripts. To use it, you first use **FileName** to select the file you want to delete. Then you pass the name of that file to **DeleteFile**, and the file goes into the great bit bucket in the sky. After using **DeleteFile**, you should have your script check the return code to see if the delete was successful.

■ **RenameFile** This XFCN, also written by Dewey Williams, lets you rename an existing file. First use **FileName** to bring the name of the file to be renamed to **RenameFile**. **RenameFile** then asks you to assign a new name. You type in the new name, click OK, and the file is renamed.

(continues)

What Are XCMDs and XFCNs?

XCMDs (external commands) and XFCNs (external functions) are chunks of code written and compiled in a standard programming language like Pascal or C. In scripts, XCMDs and XFCNs work just like any of the HyperTalk commands, but they let you compensate for some of HyperTalk's deficiencies. For example, you can access files without having to type in a long string of commands that are difficult to remember. They can also make a stack's user interface more interesting and easier to use.

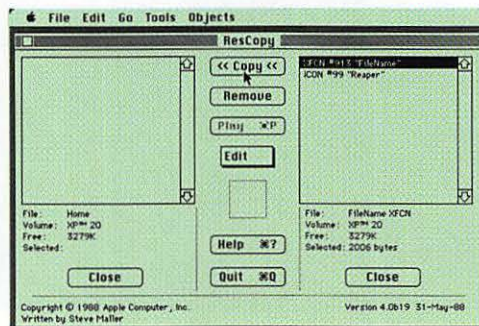
How do you take advantage of them? You first install the XCMDs or XFCNs in your Home stack or the stack you are working on. Install or delete XCMDs and XFCNs with any of several resource-moving utilities available through user groups and online services, such as Apple's ResCopy, by Steve Maller, which works much like the familiar Font/DA Mover (see "Installing an XCMD"). If you install an XCMD or XFCN in your Home card, all your stacks can use it. If you install it in a particular

stack, it will be available for use by that stack only. If you plan to distribute a stack to friends and acquaintances, install XCMDs and XFCNs in the stack itself instead of the Home stack. After you have installed an XCMD or XFCN, you program with it by typing its name into your script, just as you would any other HyperTalk command. You can also use XCMDs and XFCNs by typing them into HyperCard's message box. Once you get the hang of it, it's very simple.

XCMDs and XFCNs differ cosmetically and functionally. All XFCNs return data; XCMDs

typically do not. Most XCMDs do not have data passed to them, but when they do, the data is enclosed in quotes, such as "hi there" in the XCMD **Talk "hi there"**.

An XFCN is always followed by parentheses, which are either empty or enclose data being passed to the XFCN, as in **FileName("TEXT")**. XFCNs sometimes return a condition code that tells the script whether an operation worked. When using an XFCN, use HyperTalk's **Put** command to capture the data that the XFCN returns. Your script can then proceed based on the contents of that variable.



Installing an XCMD

To install an XCMD or XFCN, use a resource mover. In this example, ResCopy is about to add the XFCN **File-Name** to the Home stack.

Just as with DeleteFile, you need to make sure that your script checks the return code to see if the renaming worked.

Bells and Whistles

The following XCMDs and XFCNs can work wonders for your stack's user interface, making it easier to use, more visually interesting, more Mac-like, and more polished.

■ **DoList** James Paul's DoList is an XCMD that puts up a scrolling list of text strings. The user clicks on one of the strings to select it, and DoList returns that selection to the script, which then pro-


cesses it (see "DoList"). You can use DoList to set up a directory for a sound collection, so that if you click the name of one of the sounds—for example, Bells—the script will play the sound. DoList can also be used for much more complicated operations. The example script here gives the user four choices. The user selects one choice and then confirms the choice by clicking on either the Pick Me or the No Way! button. The script puts the selection into the variable called **Choice**. In this script, I've specified ONE to restrict the number of possible selections to only one of the four. With different parameters, DoList can let the user select more than one item from the list.

on MouseUp

DoList "Pick Me", "No Way!", "Eenie, Meenie, Minee, Moe.", "ONE"
put the result into Choice
end MouseUp

■ **PopUpMenu** Andrew Gilmartin's XFCN allows you to put a pop-up menu comprising several different items anywhere on the screen. To select an item, you use the pop-up menu just like any other menu. PopUpMenu then returns your selection to the script. This XFCN does some of the same things that DoList does, but it's

(continues)



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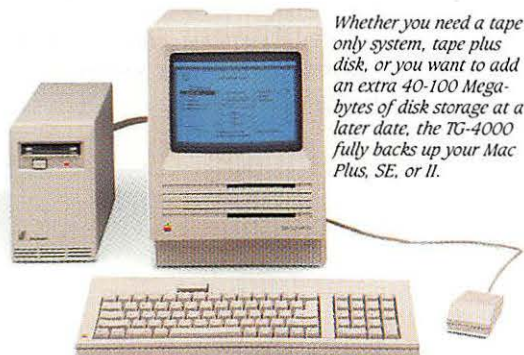
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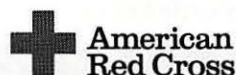
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Where to Find Stacks

The best source of public domain and shareware stacks, including the XCMDs and XFCNs discussed in this article, is your local Macintosh user group (see "A Guide to Macintosh User Groups" in this issue). Most groups sell disks of public domain stacks at modest prices, and you usually don't need to join to buy, although some groups offer a discount to members. To find a group near you, call 800/538-9696 ext. 500.

Other sources include online services such as CompuServe (800/848-8199, 614/457-0802 in Ohio) or GENie (800/638-9636, 301/340-4000 in Maryland), major user groups that sell public domain disks by mail-order, local Macintosh bulletin boards, and companies that sell public domain stacks.

Keep an eye out for anthology stacks that contain XCMDs and XFCNs discussed in this article, as well as other resources. A few collections worth looking for: Steve Drazga's Developer Tools 1.1, Randy Brown's X-Tools 1.1, Dewi Williams's XFCN and XCMD Miscellany.

User Groups

Apple Corps of Dallas, P.O. Box 835537, Richardson, TX 75083, 214/357-9185.

BMUG (Berkeley Macintosh users group), 1442A Walnut St., #62, Berkeley, CA 94709, 415/549-2684.

Boston Computer Society/Macintosh Group (BCS), 48 Grove St., Somerville, MA 02144, 617/625-7080.

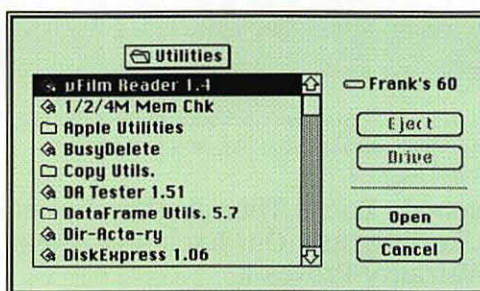
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Educomp Computer Services, 742 Genevieve, Ste. D, Solana Beach, CA 92075, 800/843-9497 (orders only), 800/654-5181 (orders in California), 619/258-0255.

The Public Domain Exchange, 2074C Walsh Ave., Santa Clara, CA 95050, 800/331-8125, 408/496-0624.



FileName

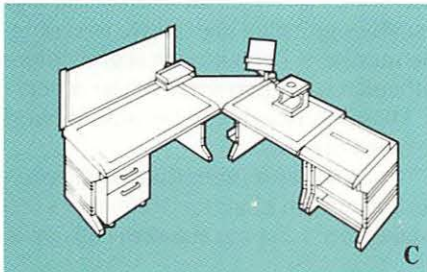
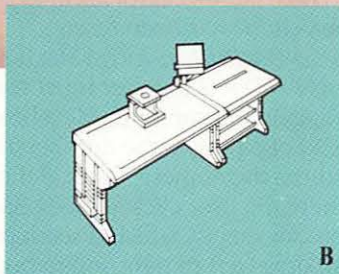
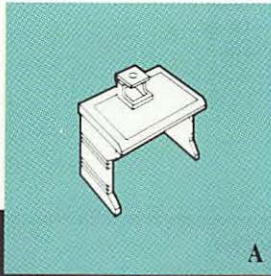
The FileName XFCN lets you select files from your script the standard Macintosh way, without having to type in the full path name.

a bit harder to use; you have to indicate where on the screen you want the pop-up menu to appear. Steve Drazga's Developer 1.1 stack has some good examples of how to use PopUpMenu.

■ **Talk** Dale Charletta's XCMD, Talk, enables your stacks to "talk" using Apple's Macintalk speech driver. You can use Talk to greet users, respond to user input, or make rude comments. The speech, however, sounds like a machine struggling with a foreign language, especially compared with more natural-sounding digitized speech. The Macintalk System file must be in your System Folder for Talk to work. To use Talk, you specify the phrase to be spo-

(continues)

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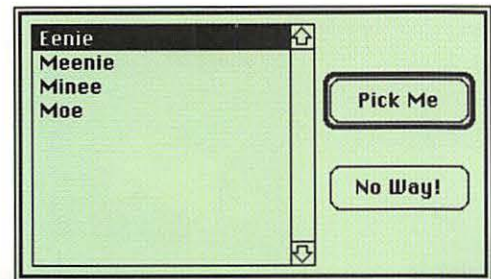
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How To/Mac Tools



DoList

Using one line of code, the DoList XFCN can make your stacks look and feel more professional—and perform better.

ken, a number that controls how fast the speech is spoken, and a number that controls pitch (how high or low the voice sounds). An example is: Talk "how do you do?", "200", "300"

Change the numbers and try different phonetic spellings for your phrase until the Macintosh sounds just right.

■ **GetPVolume/SetPVolume** When you add music, sound effects, or speech to your stacks, you may want to control the speaker volume. For example, you might want to increase the volume for a particular sound effect, such as an explosion. You can use Steven Kienle's GetPVolume XFCN to check the current volume level, which ranges from 0 to 7 (no sound to maximum volume). If the volume is not to your liking, you can use his SetPVolume XCMD to reset it. Look at the Control Panel to confirm that the volume has been reset.

■ **BarButton** Lloyd Maxfield's intriguing XCMD lets the user input numbers by dragging the cursor inside a box or bar instead of typing in the number. BarButton returns the numeric value, defined by where the user clicked (see "BarButton"). You can specify which direction the user can drag (left to right, top to bottom, and so on), and you can set the range of numeric values the bar can represent. You can also define what the bar looks like. This ability provides an interesting, more visually significant alternative to typing the numbers. BarButton is slightly more difficult to use than some of the other XCMDs described here because it offers so many options.

■ **MakeIcon** With this XCMD you can design custom icons for your stacks (see "MakeIcon"). Typing **Makelcon** calls up a Fat-

(continues)

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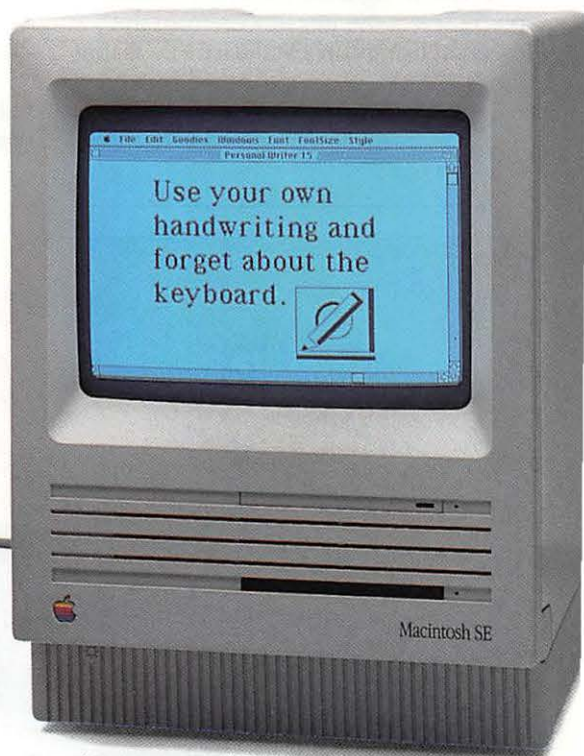
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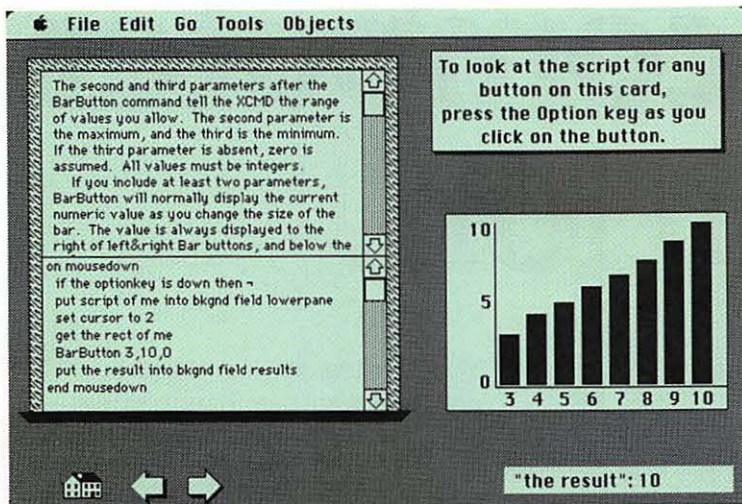
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Bits-like graphics editor that lets you design icons. You can shift the design up or down, left or right, and you can invert the icon, changing black pixels to white and vice versa for an interesting effect. Once you have designed your iconic masterpiece, select the Install icon from the menu. It brings up a Standard File dialog

box, you select the stack, and then Make-Icon installs it for posterity.

Adding Functionality

The following XCMDs and XFCNs give your scripts the ability to perform all kinds of system functions that HyperTalk can't handle.

■ **ShutDown/DoRestart** Will Cate's ShutDown and Jim Henderson's DoRestart are a pair of XCMDs that, as you might

BarButton

BarButton lets the user enter a number by dragging the cursor over the bars in the chart.

expect, shut down or restart your Mac. All you have to do is type ShutDown or DoRestart in your script, and the XCMD will do what's expected. Typing either command into HyperCard's message box has the same effect. It's only fair to ask users (using HyperCard's Ask command) if they really want to shut down or restart. This gives them a chance to change their minds and cancel the command.

■ **SysEnv** Chris Knepper's XFCN gives you all kinds of system information. It can tell you what type of Macintosh you are using, whether it has a math coprocessor or color QuickDraw, what kind of keyboard is attached, what version of the System software you are using, and many other things. SysEnv can come in handy when you are using the Home card as a Finder replacement.

Handling Text

The following set of commands helps your scripts handle text fields more effectively.

■ **Crunch** When you have a text field with many blank lines that you want to remove, Dan Wood's Crunch XFCN provides

(continues)

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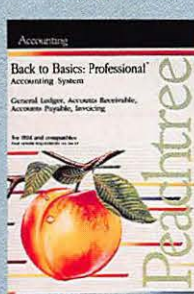
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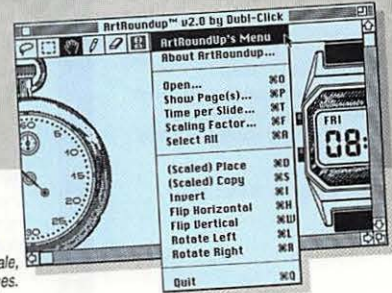
ArtRoundup comes free with WetPaint, and can Scale, Invert, Flip and Rotate the largest of paint-style images.



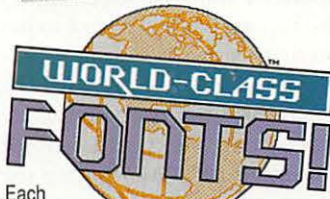
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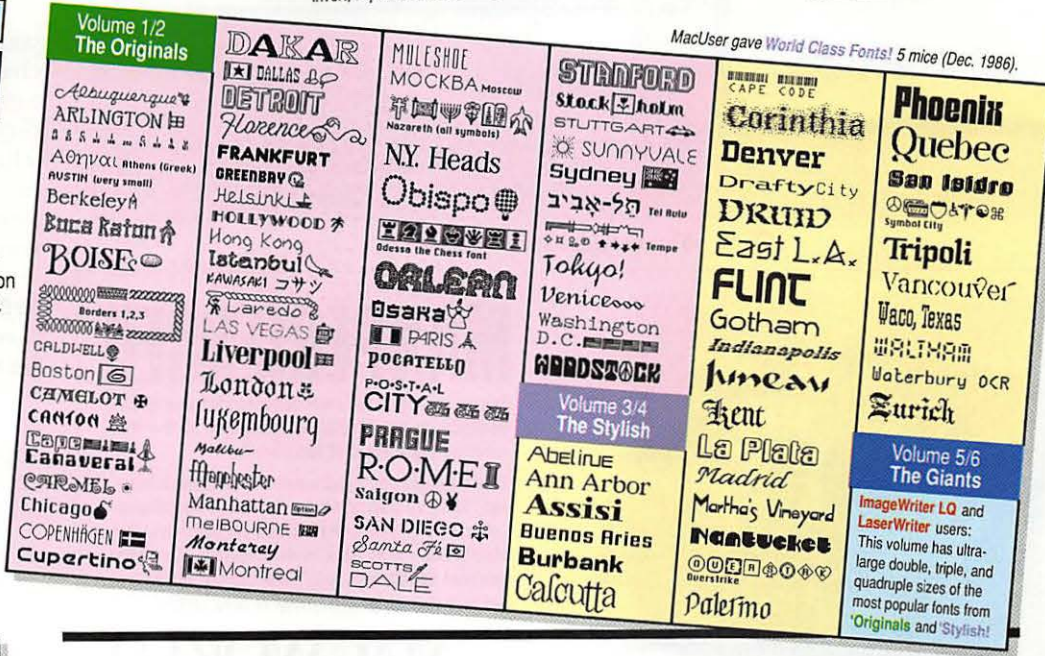
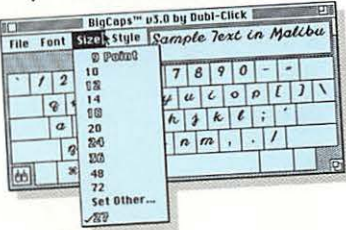
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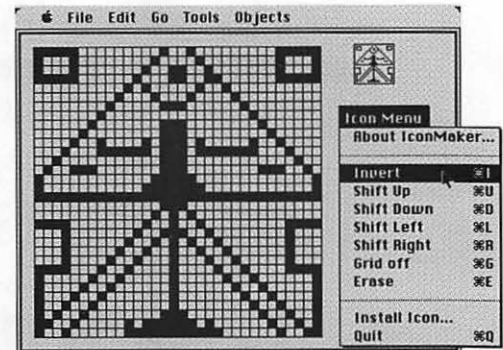
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How To/Mac Tools



Makelcon

*Makelcon's icon editor makes it simple to design and install icons while in HyperCard. This XCMD is available by typing **Makelcon** in your script or in the message box.*

a quick and easy way of doing it. You can do the same thing with a short HyperTalk script, but the XFCN works much faster. To use **Crunch**, you specify the name of the source field to be condensed and the name of the field where you want the "crunched" text to appear. The syntax: **put crunch (field "source") into field "recipient"**.

Sort Boojum Computer Systems' **Sort XFCN** comes in handy when you want to sort a long text field containing many lines. You pass it the name of the field to be sorted and the name of the field where the sorted text is to go. You can specify an alphabetic or numeric sort. Blank lines sort to the top, so you may want to get rid of them first using **Crunch**.

TrapReturn In certain situations you may not want users to type a return character into a text field. Guy De Picciotto's **TrapReturn XCMD** traps a user's carriage return and lets you put up a message telling users that they cannot enter a return. **TrapReturn** sends your card a **Return-Key** message, which you then intercept with a short script, as in this example.

On ReturnKey

Answer "You can't type a return here!" with OK
End ReturnKey

Every month more XCMDs and XFCNs appear online. Let us know if you find others that you can't imagine scripting without, so we can pass the word. □

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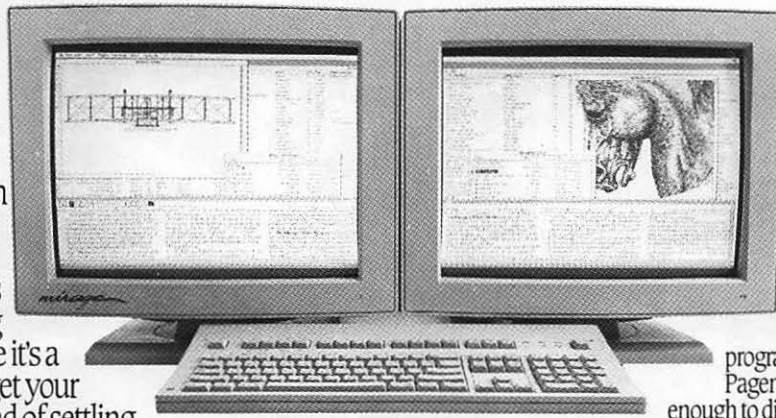
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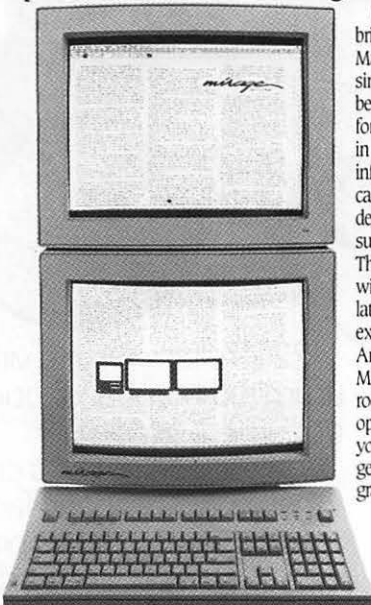
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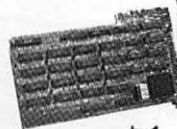


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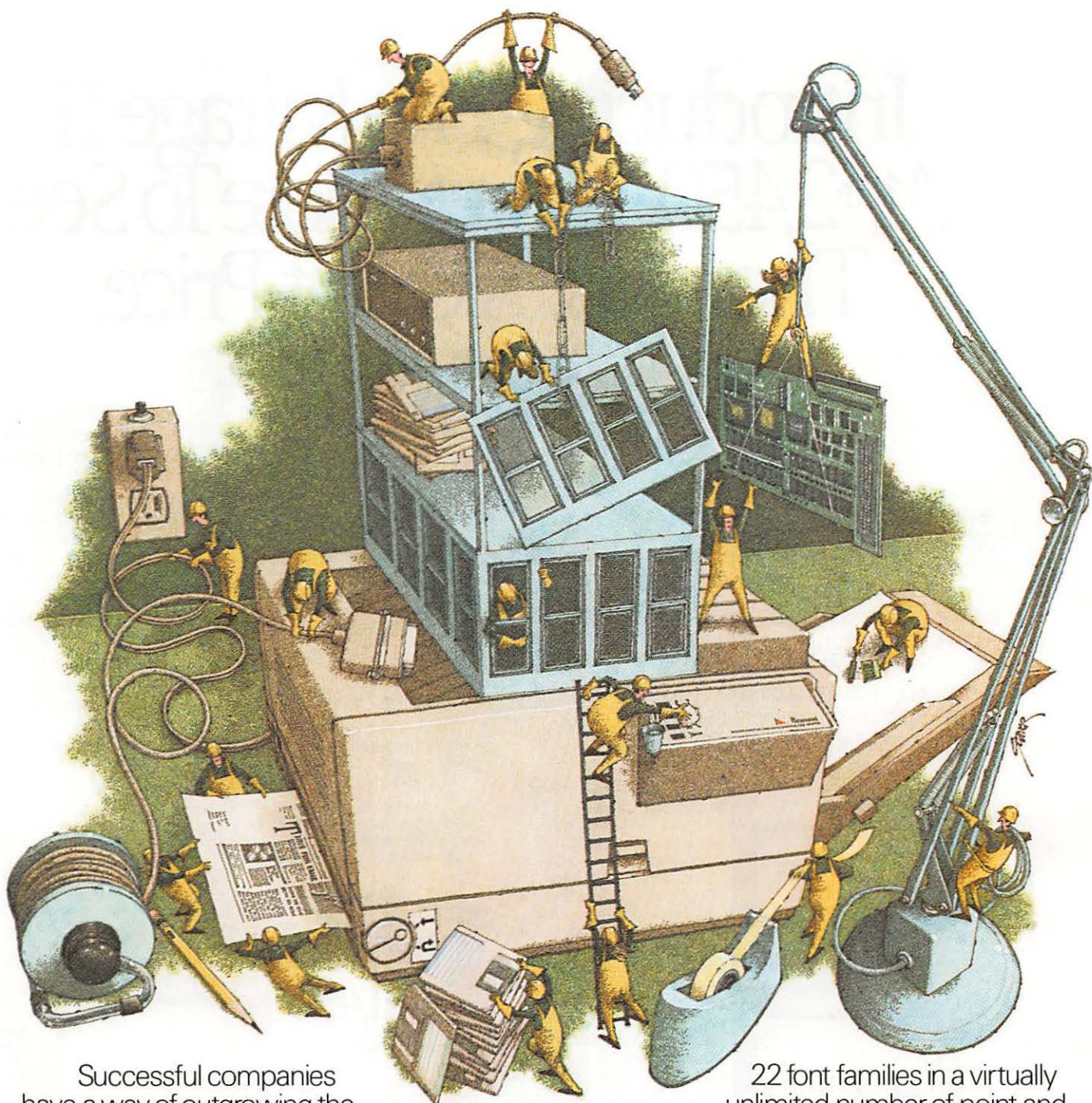
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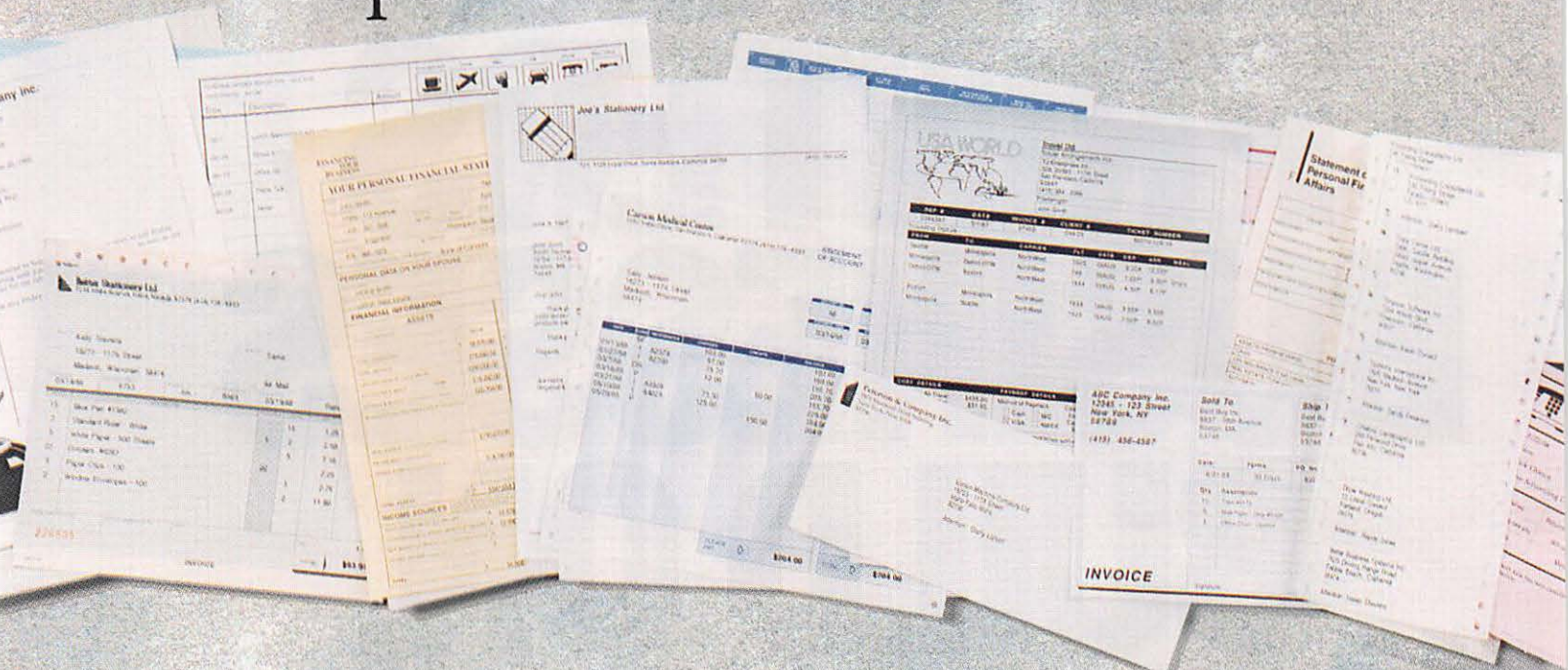
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drawing a form

A Guide to Macintosh User Groups

Nearly every day at Macworld we refer people to their local Macintosh user group for assistance in unsnarling a software problem, for help learning a complicated program or finding public domain software, or for firsthand opinions of Mac products (see "Users Friendly," Macworld, May 1988). The trick is finding a group. If you call Apple's toll-free number (800/538-9696, ext. 500), you'll get one or two referrals, but that may not help you find the group that's right for you. Here's a listing of hundreds of user groups across the country. This guide is in three parts: general user groups (for people in a particular community), organized by zip codes within states; special interest groups that have a specific focus; and national user groups, which offer services to people who don't live near the group's headquarters. New groups start up all the time, so we have undoubtedly missed some MUGs; write to us with details if your group's not on the list.

GENERAL USER GROUPS

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Birmingham Apple User Group, P.O. Box 55421, Birmingham, AL 35255, 205/870-1791. *Macintosh/Apples II.*
Quad Cities Apple Byters, P.O. Box 2251, Florence, AL 35630, 205/767-2081. *Macintosh/Apples II.*
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Macinsteins, 2835 Zeld Rd., Montgomery, AL 36106, 205/271-1087. *Macintosh only.*
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The Apple Group, P.O. Box 68, Auburn, AL 36831, 205/821-4300. *Macintosh/Apples II.*

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Tucson Apple Core, P.O. Box 43176, Tucson, AZ 85733. *Macintosh/Apples II.*
Mountain MUG, P.O. Box 15300, Northern Arizona University, Flagstaff, AZ 86011, 602/774-4980. *University—Macintosh only.*
Apple Cart, P.O. Box 2361, Page, AZ 86040, 602/645-8811. *Macintosh/Apples II.*
Oak Creek Apples, 150 Color Cove Rd., Sedona, AZ 86336, 602/282-3222. *Macintosh/Apples II.*

(continues)

User Groups Directory

Arkansas

Apple Access, 104 E. Elm St., El Dorado, AR 71730, 501/862-1155. *Macintosh/Apple II.*
Little Rock Apple Company Users Group, 303 McMillen Trail, Little Rock, AR 72207, 501/663-5208. *Macintosh/Apple II.*
Eureka Springs Apple Users, Rt. 4, Box 554, U.S. 62 E, Eureka Springs, AR 72632, 501/253-8418. *Macintosh only.*
Fayetteville Apple Users Group, P.O. Box 204, Fayetteville, AR 72702, 501/442-7040. *Macintosh/Apple II.*

California

Computech, 801 S. Gramercy Dr., #201, Los Angeles, CA 90005, 213/383-3819. *Macintosh/Apple II.*
USC Macintosh User Group, 1025 S. Sierra Bonita Ave., Los Angeles, CA 90019, 213/937-4082. *University-Macintosh only.*
UCLA Macintosh Users Group, UCLA Graduate School of Education, Los Angeles, CA 90024, 213/825-1944. *University-Macintosh only.*
Los Angeles Macintosh Group, 12021 Wilshire Blvd., #349, Los Angeles, CA 90025, 213/278-5264. *Macintosh only.*
A La Mac, P.O. Box 27429, Los Angeles, CA 90027, 213/462-2860. *Macintosh only.*
Mac Surf, 1600 Campus Rd., #246, Los Angeles, CA 90041, 213/259-2611. *University-Macintosh only.*
King Drew Macintosh User Group, Rm. 4016, Dermatology, King Drew Medical Center, 12021 S. Wilmington Ave., Los Angeles, CA 90059, 213/603-4578. *University-Macintosh/Apple II.*
South Bay Apple Mac User Group, Box 432, Redondo Beach, CA 90277, 213/316-7738. *Macintosh only.*
Original Apple Corps, 15 Paloma Ave., #24, Venice, CA 90291, 213/396-5515. *Macintosh/Apple II.*
Macbug, 13800 Biola Ave., c/o Dr. R. Rigsby, Talbot School of Theology, La Mirada, CA 90639, 213/944-0351. *University-Macintosh only.*
AMUG, 10356 Beach Blvd., Stanton, CA 90680. *Macintosh only.*
West Orange County MUG, P.O. Box 5099, Los Alamitos, CA 90721. *Macintosh only.*
Tri-City Apple User Group, P.O. Box 975, South Pasadena, CA 91030, 213/258-4466. *Macintosh/Apple II.*
JPL Mac User Group, 4800 Oak Grove Dr., M/S 300-243, Pasadena, CA 91109, 818/354-0496. *University-Macintosh only.*
Concejo-Ventura Macintosh User's Group, P.O. Box 7118-MAC, Thousand Oaks, CA 91359, 805/584-8733. *Macintosh only.*
Mac Valley Users Group, P.O. Box 4297, Burbank, CA 91503, 818/848-1277. *Macintosh only.*
Lerc Aces, P.O. Box 551, 3711 La Crescenta Ave., Burbank, CA 91520. *Macintosh/Apple II.*
CHOMP, P.O. Box 986, Claremont, CA 91711, 714/846-4774. *Macintosh only.*
Mac-Mania MUG, 963 Nottingham Dr., Corona, CA 91720, 714/735-6814. *Macintosh only.*
UC Riverside Mac User Group, 869 Crest Vista Dr., Monterey Park, CA 91754, 714/684-7249. *University-Macintosh only.*
San Gabriel Valley Mac User Group, 927 N. Rose Glen Ave., Rosemead, CA 91770, 213/684-4266. *Macintosh only.*
San Diego Macintosh User Group, P.O. Box 12561, La Jolla, CA 92037, 619/789-9492. *Macintosh only.*
North County Appleholics, P.O. Box 4442, Oceanside, CA 92054, 619/757-6352. *Macintosh/Apple II.*
Demons, 630 Cabrillo Ave., Coronado, CA 92118, 619/435-0554. *Macintosh/Apple II.*
Macdesert Connection, 255 N. El Cielo Rd., #629, Palm Springs, CA 92262, 619/320-4003. *Macintosh only.*
Empire Mac User Group, 33418 Rosemond, Yucaipa, CA 92399, 714/864-4872. *Macintosh only.*
Applejacks of the Inland Empire, Box 23025, San Bernardino, CA 92406, 714/883-2234. *Macintosh/Apple II.*
U.C.R. MUG, 5505 Canyon Crest, #30, Riverside, CA 92507, 714/788-2167. *University-Macintosh only.*
Professional Loma Linda University User Group, PR & Development Office, LLU/LSC, Riverside, CA 92515. *University-Macintosh only.*
Orange Apple Computer Club, 25422 Trabuco Rd., Bldg. 105, #251, El Toro, CA 92630, 714/770-1865. *Macintosh/Apple II.*
Macbeach User Group, P.O. Box 2178, Huntington Beach, CA 92647, 714/842-0518. *Macintosh only.*
The Coffee MUG, 1104 England St., Huntington Beach, CA 92648, 714/969-2625. *Macintosh only.*
Mac Orange, P.O. Box 1830, Santa Ana, CA 92702, 714/871-6329. *Macintosh only.*
Golden West College Computer Club, 9050 La Linda Ave., Fountain Valley, CA 92708. *University-Macintosh/Apple II.*
McDonnell Douglas Astro Apple, 16681 Mt. Darwin Circle, Fountain Valley, CA 92708, 714/839-1139. *Macintosh/Apple II.*
South Orange County Computer, 10221 Sketer Ave., #103-593, Fountain Valley, CA 92708. *Macintosh/Apple II.*
Pacific Mac Group, 417 Meadowbrook Pl., Anaheim, CA 92801, 714/776-4066. *Macintosh/Apple II.*
South Coast Macintosh Users Group, Box 2035, Goleta, CA 93118, 805/685-7295. *Macintosh only.*
Visalia Mac Enthusiasts Group, 207 E. Prospect Ct., Visalia, CA 93291. *Macintosh only.*
Santa Maria & Lompoc Appleuser, 265 Shirley Ln., Santa Maria, CA 93455. *Macintosh/Apple II.*
Ridgecrest Apple User Group, 236 Primrose St., Ridgecrest, CA 93555, 619/375-9510. *Macintosh/Apple II.*
Sierra Apple Orchard, P.O. Box 16275, Fresno, CA 93755, 209/439-2446. *Macintosh/Apple II.*
Club Mac of Monterey, Box 222988, Carmel, CA 93922, 408/624-8907. *Macintosh only.*
Informal Computer-Using Educators, P.O. Box 339, Los Altos, CA 94023, 415/969-4679. *Macintosh/Apple II.*
Mid-Day Mac Users, P.O. Box 626, Moss Beach, CA 94038, 415/728-5462. *Macintosh only.*

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Performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ease of Learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ease of Use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Error Handling	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Support	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Value	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

General Ledger

- entire fiscal year available for reports
- user definable chart of accounts
- prior period posting
- produces full audit trail

Payables/Receivables

- uses open invoice method
- prints checks, invoices and statements
- user defined aging periods

Payroll

- uses built-in payroll formulas; no user-maintained tables
- automatic federal and state deductions
- accumulates QTD, YTD, W-2, 940 and 941 information

Inventory

- fully integrated with payables and receivables
- uses average weighted cost method
- handles adjustments and transfers

Jobcost

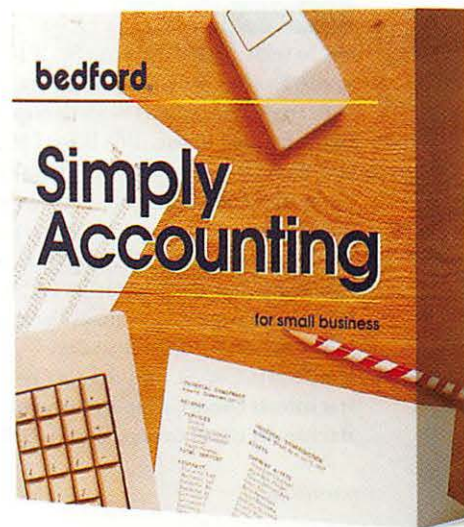
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- Apple® Macintosh™ computer with one megabyte of memory, 1 800K disk drive and 128K ROM

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San Francisco Community College MUG, 2554 29th Ave., San Francisco, CA 94116. *University—Macintosh only.*
Mad Macs (Beyond ThunderScan), 729 Fifth Ave., San Francisco, CA 94118. *Macintosh only.*
Whole Earth Well, 18 Sequoia Way, San Francisco, CA 94127, 415/469-8862. *Macintosh only.*
San Francisco Apple Care, P.O. Box 281797, San Francisco, CA 94128, 415/771-5830. *Macintosh/Apple II.*
UCSF Apple Users Group, c/o Bruce Payne, CVRI Box 0130, San Francisco, CA 94143. *University—Macintosh/Apple II.*
S P A C E, 3790 El Camino, #251, Palo Alto, CA 94306, 415/856-9294. *Macintosh/Apple II.*
Stanford Macintosh Users Group, Box 2354, Stanford, CA 94309, 415/723-7684. *University—Macintosh only.*
San Leandro Apple Eaters, 838 Mayo Ct., Benicia, CA 94510. *Macintosh/Apple II.*
Diablo Valley Apple User Group, P.O. Box 5031, Concord, CA 94524, 415/680-4271. *Macintosh/Apple II.*
Mouse, 2198 Vista Luna, Fairfield, CA 94533, 707/426-2312. *Macintosh only.*
SPC Apple, P.O. Box 8019, Fremont, CA 94537, 408/738-8330. *Macintosh/Apple II.*
Livermore Users Group, 685 Las Positas Blvd., Livermore, CA 94550. *Macintosh only.*
Napa Apple User Group, P.O. Box 6801, Napa, CA 94581. *Macintosh/Apple II.*
North Bay Users Group, P.O. Box 7156, Vallejo, CA 94590. *Macintosh/Apple II.*
Mills College MUG, 5000 MacArthur Blvd., Oakland, CA 94613, 415/430-2167. *University—Macintosh only.*
East Bay Macintosh Users Group, 555 Pierce St., Albany, CA 94706, 415/758-2741. *Macintosh only.*
Berkeley Macintosh Developers Group, 930 34th St., Richmond, CA 94805, 415/849-4357. *Macintosh only.*
Macs of Marin, 23 Pleasant Ln., San Rafael, CA 94901, 415/459-5707. *Macintosh only.*
Silicon Apple Prog. Society, 18138 Bancroft, Monte Sereno, CA 95030. *Macintosh/Apple II.*
Association of Apple 32 Users, P.O. Box 634, Santa Clara, CA 95052, 408/263-0398. *Macintosh only.*
Programmers and Interfacing Enthusiasts, P.O. Box 2185, Santa Clara, CA 95055, 408/243-0234. *Macintosh/Apple II.*
MacDoves, 1424 Glen Canyon Rd., Santa Cruz, CA 95060. *Macintosh only.*
Macruzers, P.O. Box 2508, Santa Cruz, CA 95062, 408/458-9850. *Macintosh only.*
Apple Blossom Users Group, P.O. Box 53323, San Jose, CA 95123. *Macintosh/Apple II.*
ChipMUG, 1015 Nevada Pl., San Jose, CA 95125, 408/298-2469. *Macintosh only.*
Stockton Apple User Group, 6333 Pacific Ave., #186, Stockton, CA 95207, 209/957-9389. *Macintosh only.*
Merced Mac, 333 W. 20th St., Merced, CA 95340, 209/383-0727. *Macintosh only.*
North Coast Mac User Group, Box 14144, Santa Rosa, CA 95402, 707/545-5112. *Macintosh only.*
MCMUG, 532 S. State St., Ukiah, CA 95482. *Macintosh only.*
Sequoia Macintosh Users Group, Box 4715, Arcata, CA 95521, 707/822-1874. *Macintosh only.*
Auburn Macintosh Users Group, 11428 F Ave., Auburn, CA 95603, 916/888-7433. *Macintosh only.*
Davis Macintosh Users Group, P.O. Box 2141, Davis, CA 95616, 916/758-4383. *Macintosh only.*
Davis Apple User Group, P.O. Box 1534, Davis, CA 95617, 916/756-5063. *Macintosh/Apple II.*
Apple Sac, Inc.—Apple Computer Users Group of Sacramento, Box 254645, Sacramento, CA 95825. *Macintosh/Apple II.*
Sacramento's University Macintosh Club, 4248 N. River Way, Sacramento, CA 95864, 916/481-3380. *University—Macintosh only.*
Trinity Users Group, Star Rt. 2, Box 4792, Trinity Center, CA 96091. *Macintosh/Apple II.*

Colorado

MacinTech, 6635 S. Dayton St., #160, Englewood, CO 80111. *Macintosh only.*
Apple Three User Group, P.O. Box 3155, Englewood, CO 80155, 303/791-0887. *Macintosh/Apple II.*
Mile High Macintosh User's Group, 855 S. Grant St., Denver, CO 80209, 303/869-9393. *Macintosh only.*
Denver Apple Pi Inc., P.O. Box 17467, Denver, CO 80217, 303/422-1214. *Macintosh/Apple II.*
Mac West Users Group, 981 S. Foothill Dr., Lakewood, CO 80235, 303/989-6800. *Macintosh only.*
Computer C.A.C.H.E., Box 37313, Denver, CO 80237, 303/771-2019. *Macintosh only.*
Boulder Mac Meeting, 6727 Lakeview Dr., Boulder, CO 80303, 303/494-7186. *Macintosh only.*
The Apple Resource Group, P.O. Box 451, Eastlake, CO 80614, 303/451-6116. *Macintosh/Apple II.*
Greeley Outpost Club Mac, 1955 23rd Ave., Greeley, CO 80631, 303/352-4085. *Macintosh only.*
Silicon Mountain Macintosh Users Group, c/o Greg Kelly, 3440 Oro Blanco Dr., Colorado Springs, CO 80917, 719/597-2695. *Macintosh only.*
M-BUG, 115 Elm St., Trinidad, CO 81082, 719/846-4367. *Macintosh only.*
Macintosh Users Group in Telluride, Box 112, Telluride, CO 81435, 303/728-3469. *Macintosh only.*
Macintosh Users Group, Box 1146, Basalt, CO 81621, 303/925-7262. *Macintosh only.*

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User Groups Directory

Connecticut

The Connecticut Macintosh Connection, 5 Fox Chase Rd., Bloomfield, CT 06002, 203/242-2684. *Macintosh only.*
Informatics Group, 80 Shield St., West Hartford, CT 06110, 203/724-4040. *University-Macintosh/Apples II.*
H.U.G.E., Box 18027, East Hartford, CT 06118, 203/568-0492. *Macintosh/Apples II.*
U Conn Mac User's Group, c/o Tom Terry, U-44, University of Connecticut, Storrs, CT 06268. *University-Macintosh only.*
Southeastern CT Apple User Group, P.O. Box 510, Gales Ferry, CT 06335, 203/464-9372. *Macintosh/Apples II.*
Southern Connecticut Mac User Group, 269 Thames St., Groton, CT 06340. *Macintosh only.*
Applefield Users Group, 565 Long Hill Rd., Groton, CT 06340, 203/265-1000. *Macintosh only.*
Yale Mac Users' Group, Box 20A Yale Station, New Haven, CT 06520, 203/865-6163. *University-Macintosh only.*
The Apple Corps, 10 Lords Hwy., Weston, CT 06883, 203/227-0921. *Macintosh only.*
Greater Danbury Macintosh User Group, P.O. Box 295, West Redding, CT 06896, 203/746-0668. *Macintosh only.*
The Group, 98 Hoyt St., #4d, Stamford, CT 06905, 203/325-4250. *Macintosh only.*

Delaware

Macintosh Users of Delaware, Box 17, Rockland, DE 19732. *Macintosh only.*
Del Ches Systems, 2204 N. Church St., Wilmington, DE 19802, 302/658-0735. *Macintosh/Apples II.*
Macintosh Gamers of America, 116 Weldin Park Dr., Wilmington, DE 19803. *Macintosh only.*
Delmarva Apple Users Group, RD 2, Box 94-A, Bridgeville, DE 19933, 302/945-9520. *Macintosh/Apples II.*

Florida

North Florida MUG, P.O. Box 10262, Jacksonville, FL 32247, 904/731-0851. *Macintosh only.*
Tallahassee Apple User Group, P.O. Box 11112, Tallahassee, FL 32302, 904/599-3316. *Macintosh/Apples II.*
Mac Bay Users Group, 1712-A Deer Ave., Panama City, FL 32401. *Macintosh only.*
Pensacola Macintosh User Group, P.O. Box 18550, Pensacola, FL 32503. *Macintosh only.*
Macintosh Computer Club of Pensacola, Box 15390, Pensacola, FL 32514, 904/478-1112. *Macintosh only.*
Macplayground MUG, Box 3195, Fort Walton Beach, FL 32548, 904/862-4908. *Macintosh only.*
Suffolk Apple Computer Society, 506 Greenwood Cove S, Niceville, FL 32578, 904/678-8007. *Macintosh/Apples II.*
De Mac, 400 Nut Tree, Deland, FL 32724, 904/736-1953. *Macintosh only.*
MacMAD, P.O. Box 194, Melbourne, FL 32902, 407/729-6004. *Macintosh only.*
Space Coast Apple Users Group, P.O. Box 2112, Merritt Island, FL 32952, 407/452-8357. *Macintosh/Apples II.*
Florida Keys Macintosh Users Group, Florida Keys Community College, Key West, FL 33040, 305/296-9081. *Macintosh only.*
National Macintosh Computer Society, Box 8589, Coral Springs, FL 33075, 305/941-8286. *Macintosh only.*
Miami Beach Apple Club, 5701 Collins Ave., #1709, Miami Beach, FL 33140, 305/866-5507. *Macintosh/Apples II.*
Miami's Big Apple User Group, Box 63-04, Miami, FL 33163, 305/948-8000. *Macintosh/Apples II.*
Gold Coast Mac, Inc., Box 452305, Miami, FL 33245, 305/447-7888. *Macintosh only.*
The Source Apple Expert, 2786 Tennis Club Dr., #305, West Palm Beach, FL 33417, 407/689-3330. *Macintosh/Apples II.*
Florida Innovation Group, P.O. Box 16645, 11606 Malcolm McKinley, Tampa, FL 33687, 813/971-1025. *Macintosh only.*
Holiday Area Macers Ham, 8700 N. 50th St., #428, Tampa, FL 33687, 800/548-8282. *Macintosh only.*
Swacks, 18141 Palm Creek Dr., North Fort Myers, FL 33917, 813/543-6329. *Macintosh/Apples II.*
Naples Mac Friends, 1800 Tiller Terr., Naples, FL 33940, 813/261-8208. *Macintosh only.*
Spring Hill Apple Computer Enthusiasts, 5228 Derby Ave., Spring Hill, FL 34608, 904/686-6479. *Macintosh/Apples II.*
Bay Area Macintosh Users Group, 11335 112th St. N, Largo, FL 34648, 813/398-6702. *Macintosh only.*
So. Florida Macintosh Users Group, 2109 Erwin Rd., Port St. Lucie, FL 34952, 407/337-0758. *Macintosh only.*

Georgia

Mac Atlanta, 3127 Bunker Hill Circle, Marietta, GA 30062, 404/971-9661. *Macintosh only.*
Widget Apple Group, 4285 Loch Highland Pass, Roswell, GA 30075, 404/992-2553. *Macintosh/Apples II.*
Atlanta Macintosh Users Group, P.O. Box 2941, Norcross, GA 30091, 404/231-9527. *Macintosh only.*
LAMUG, 824 Azalea Dr., Lagrange, GA 30240. *Macintosh/Apples II.*
Emory Mac User Group, Dept. of Geology, Emory University, Atlanta, GA 30322, 404/727-0118. *University-Macintosh only.*
Atlanta Area Apple Users Group, 868 Castle Falls Dr. NE, Atlanta, GA 30329, 404/662-6957. *Macintosh/Apples II.*
Athens Mac Users, Barrow Hall, Rm. 112, University of Georgia, Athens, GA 30602, 404/542-5359. *University-Macintosh only.*
Classic Apple Users Group, 2211 Belmont Rd., Arnoldsville, GA 30619, 404/353-4615. *Macintosh/Apples II.*
Augusta Mac Masters, 2933 Foxhall Circle, Augusta, GA 30907, 404/860-6818. *Macintosh only.*

(continues)

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User Groups Directory

Mercer University Mac Users, Media Center, Mercer University, Mercer, GA 31207, 912/744-2985. *University—Macintosh only.*
Savannah MUG, 13 Cutler Ct., Savannah, GA 31419, 912/925-2188. *Macintosh only.*
South Georgia Apple Core, 1618E Bird Ct., Valdosta, GA 31602, 912/244-9363. *Macintosh/Apple II.*

Hawaii

Kauai Apple Users Group, P.O. Box 1540, Kapaa, HI 96746, 808/822-4558. *Macintosh/Apple II.*
Hawaii Macintosh User Group, P.O. Box 1355, Pearl City, HI 96782, 808/456-1610. *Macintosh only.*
Maui Macintosh Users Group, RR 1, Box 98, Wailuku, HI 96793, 808/572-0630. *Macintosh only.*

Idaho

Idaho Falls Mac Users Group, 294 Davidson Dr., Idaho Falls, ID 83401, 208/523-0004. *Macintosh/Apple II.*
Canyon Macintosh Users Group, 1110 W. Ash, Caldwell, ID 83605, 208/454-8862. *Macintosh only.*
Macintosh User's Group of Southern Idaho, 5182 Latigo, Boise, ID 83709, 208/345-0346. *Macintosh only.*
Boise State Academic Apple Users, Chemistry Department, Boise State University, Boise, ID 83725, 208/385-3964. *University—Macintosh/Apple II.*
IPHAUG, 11765 Diamond Dr., Hayden Lake, ID 83835, 208/772-4552. *Macintosh only.*

Illinois

Apple Developers Consortium, 703 W. Victoria Ln., Arlington Heights, IL 60005, 312/640-8082. *Macintosh only.*
Macadamia Mac Users Group, P.O. Box 239, Cary, IL 60013, 312/639-4960. *Macintosh only.*
Northwestern Mouse User Group, NU ACNS, 2129 Sheridan Rd., Evanston, IL 60208, 312/491-3290. *University—Macintosh only.*
Apple Enthusiast Society of Oak Park, 820 Bonnie Brae, River Forest, IL 60305, 312/366-7864. *Macintosh/Apple II.*
Illinois Macintosh Users Group, 2314 Mason, Joliet, IL 60435, 815/744-2073. *Macintosh only.*
DuPage Apple User Group, P.O. Box 294, Downers Grove, IL 60515, 312/993-3897. *Macintosh/Apple II.*
Indian Hill Computer Hobbyists, AT&T Bell Labs, Rm. 6K31, Naperville & Wheaton Rds., Naperville, IL 60566, 312/979-2028. *Macintosh/Apple II.*
University of Chicago MUG, 5528 S. Hyde Park Blvd., #1106, Chicago, IL 60637, 312/288-5199. *University—Macintosh only.*
The Rest of Us, Box 3500, Chicago, IL 60654, 312/525-4761. *Macintosh only.*
Stateline Macintosh Users Group, 3703 N. Main, Rockford, IL 61103, 815/633-9494. *Macintosh only.*
Central Illinois Mac User Group, 1501 W. Bradley Ave., Peoria, IL 61625, 309/677-2766. *Macintosh only.*
The Mac Pac, P.O. Box 1512, Bloomington, IL 61702, 309/828-3145. *Macintosh only.*
Champaign-Urbana Macintosh Users Group, c/o Gail Kampmeier, 172 Natural Resources Bldg., 607 E. Peabody, Champaign, IL 61820. *University—Macintosh only.*
Champaign-Urbana Apple User Group, 1908 Barberry Circle, Champaign, IL 61821. *Macintosh/Apple II.*
Metro MUG, 13 Yorkshire Ln., #6, Belleville, IL 62221, 618/234-4333. *Macintosh only.*
Macintosh Computer User Group of Sangamin, Box 2344, Springfield, IL 62705, 217/782-9845. *Macintosh only.*
Crab Apple Users Group, P.O. Box 338, Carbondale, IL 62901, 618/893-4489. *Macintosh/Apple II.*
Macintosh User Group of Southern Illinois, Computer Corner, University Mall, Carbondale, IL 62901, 618/529-5000. *Macintosh only.*
Southern Illinois Apple User Group, RR 2, Box 42, Cobden, IL 62920. *Macintosh only.*
Little Egypt Apple Users Group, P.O. Box 1122, Murphysboro, IL 62966, 618/684-2752. *Macintosh/Apple II.*

Indiana

Macgenius, 1102 Sherri Ln., Lebanon, IN 46052, 317/482-5657. *Macintosh only.*
The Apple Pickers Inc., P.O. Box 20136, Indianapolis, IN 46220, 317/291-4042. *Macintosh/Apple II.*
Apple UG Michiana, 423 W. Bike, Bremen, IN 46506, 219/546-4050. *Macintosh/Apple II.*
Mad Macs, Notre Dame University, Computing Center, Notre Dame, IN 46556, 219/239-5600. *University—Macintosh only.*
Fort Wayne MUG, P.O. Box 5673, Fort Wayne, IN 46895, 219/749-4444. *Macintosh only.*
Kokomo Apple Users Group, 611 S. Webster St., Kokomo, IN 46901, 317/452-2616. *Macintosh/Apple II.*
Muncie MacPack, P.O. Box 2407, Muncie, IN 47307, 317/747-6178. *Macintosh only.*
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The Macintosh Group of Southern Indiana, 748 Stewart Ave., Evansville, IN 47715, 812/423-6869. *Macintosh only.*
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Ames Apple Users Group, P.O. Box 703, Ames, IA 50010, 515/232-1652. *Macintosh/Apples II.*
Iowa State Mac Users Group, 301 S. 5th St., #355, Ames, IA 50010, 515/233-4807. *University—Macintosh only.*
Club Mac Midwest, P.O. Box 468, Johnston, IA 50131, 515/270-6916. *Macintosh only.*
Apple Seed, Box 1281, Marshalltown, IA 50158, 515/752-0883. *Macintosh/Apples II.*
Newton Apple Corps, P.O. Box 1263, Newton, IA 50208, 515/792-8695. *Macintosh/Apples II.*
Marion County Computer Club, 503 Broadway, Pella, IA 50219, 515/842-3101. *Macintosh/Apples II.*
Roland-Story Apple Users Group, P.O. Box D, Roland, IA 50236, 515/388-5576. *Macintosh/Apples II.*
Glitch Kickers Computer Club, Box H, Waukee, IA 50263, 515/288-0255. *Macintosh/Apples II.*
Central Iowa Mac Publishers, 3106 Ingersoll Ave., Des Moines, IA 50312, 515/274-9271. *Macintosh only.*
Iowa MUG, 667 49th St., Des Moines, IA 50312, 515/279-9650. *Macintosh only.*
Waterloo/Cedar Falls CIA-MUG, P.O. Box 143, Cedar Falls, IA 50613, 319/266-0634. *Macintosh only.*
Green Apples User group, P.O. Box 2224, Waterloo, IA 50704, 319/268-0066. *Macintosh/Apples II.*
The Tree House, 219 W. Montgomery, Creston, IA 50801, 515/782-4315. *Macintosh/Apples II.*
MUGSI, 3303 Rebecca St., Box 2100, Sioux City, IA 51104, 712/279-5549. *Macintosh only.*
Western IA Apple Users, RR 4, Box 96, Harlan, IA 51537, 712/744-3619. *Macintosh/Apples II.*
Tri State Micro Computer Club, 15700 Five Points Rd., Durango, IA 52039, 319/556-1874. *Macintosh/Apples II.*
Iowa City Apple Group, P.O. Box 1267, Iowa City, IA 52244, 319/354-7137. *Macintosh/Apples II.*
Cedar Rapids Macintosh User, Rt. 2, Box 188-A, Solon, IA 52333, 319/848-4484. *Macintosh only.*
Central Iowa Area Macintosh User Group, 99½ 16th Ave. SW, Cedar Rapids, IA 52404, 319/363-1242. *Macintosh only.*
Macknowlia, P.O. Box 1691, Fairfield, IA 52556, 515/472-7523. *University—Macintosh only.*
Apple Burlington Users Group, P.O. Box 508, West Burlington, IA 52655, 319/753-0846. *Macintosh/Apples II.*

Kansas

Apple Bits Users Group Inc., P.O. Box 368, Shawnee Mission, KS 66201, 816/523-1007. *Macintosh/Apples II.*
Kansas City Mac Core, Box 2177, Shawnee Mission, KS 66201, 816/472-7226. *Macintosh only.*
Kaw River Mac Users Group, P.O. Box 454, Manhattan, KS 66502, 913/537-8867. *Macintosh only.*
Topeka Macintosh Users Group, 1328 S.W. 30th, Topeka, KS 66611, 913/233-9815. *Macintosh only.*
MacWichita, P.O. Box 48604, Wichita, KS 67201, 316/777-0492. *Macintosh only.*
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Shreveport Area Macintosh User, P.O. Box 5150, Shreveport, LA 71135, 318/861-9372. *Macintosh only.*

Maine

Maine Macintosh Owners and Operators, P.O. Box 1025, Brunswick, ME 04011, 207/725-8417. *Macintosh only.*
Southern Maine Apple Users Group, RR 1, Box 206, Freeport, ME 04032, 207/865-3970. *Macintosh/Apples II.*
Kennebec Apple Users Group, P.O. Box 1166, Waterville, ME 04901, 207/873-2880. *Macintosh/Apples II.*

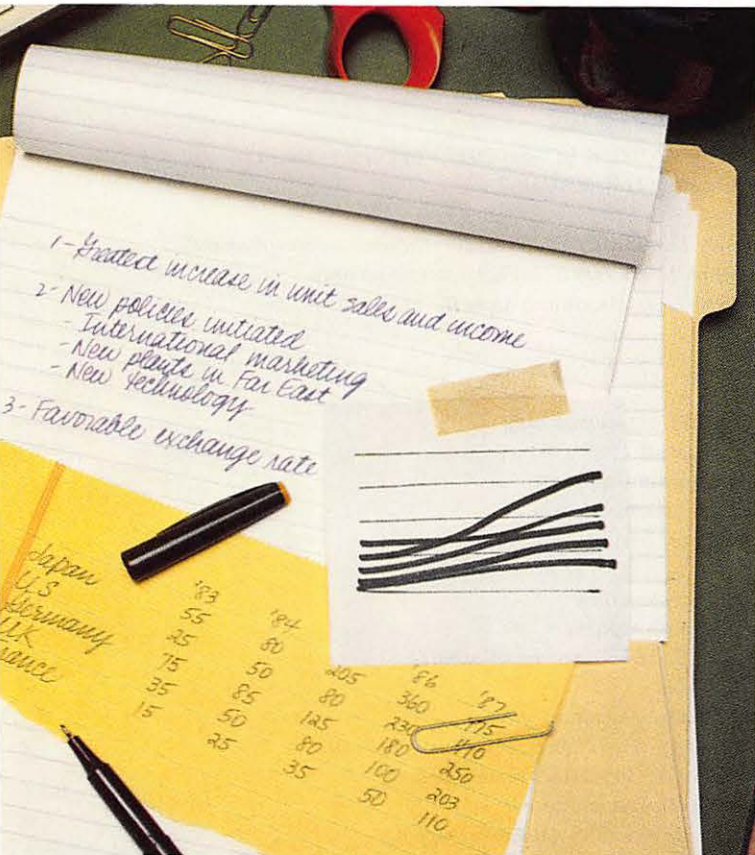
Maryland

Southern Maryland Apple Users, P.O. Box 398, Lexington Park, MD 20653, 301/862-2364. *Macintosh/Apples II.*
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Washington Apple Pi, Ltd., 8227 Woodmont Ave., #201, Bethesda, MD 20814, 301/654-8060. *Macintosh/Apples II.*

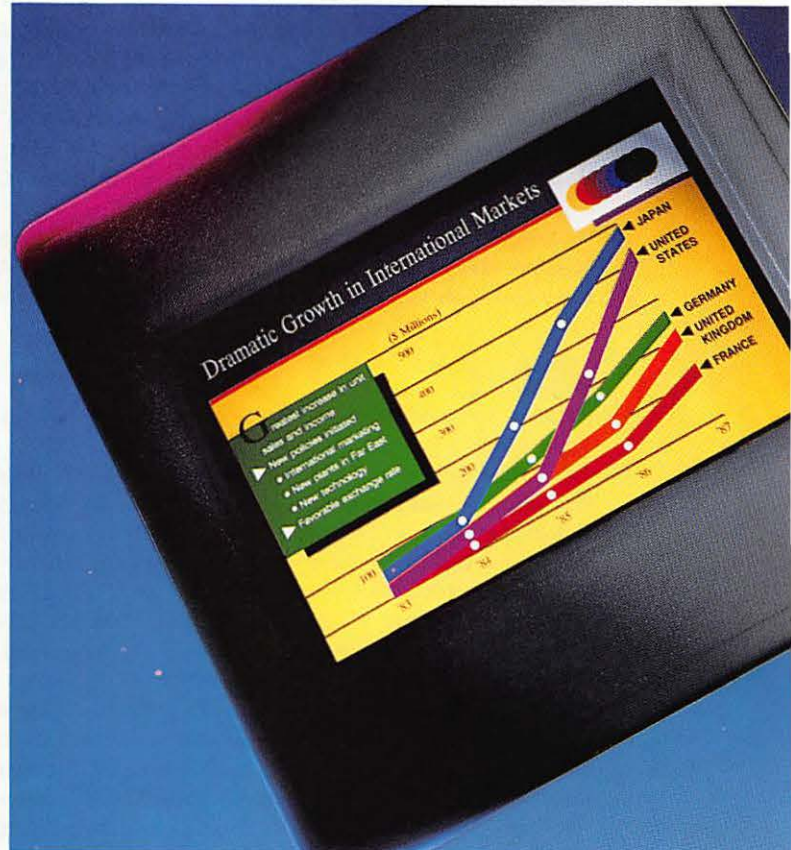
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Harford Community College Apple Users, 401 Thomas Run Rd., Bel Air, MD 21014, 301/836-4315. *University—Macintosh/Apple II.*
Reisterstown Apple Users Group, 6 Kingsley Rd., Owings Mills, MD 21117. *Macintosh/Apple II.*
WMCmug, Western Maryland College, Westminster, MD 21157, 301/857-2477. *Macintosh/Apple II.*
Maryland Apple Corps, P.O. Box 2353, Baltimore, MD 21203. *Macintosh/Apple II.*

Massachusetts

Apple Core Berkshire County, 14 Hutchinson Ln., Lenox, MA 01240, 413/637-1593. *Macintosh/Apple II.*
Worcester Mac Users Group, 47 West St., E. Douglas, MA 01516, 617/476-7014. *Macintosh only.*
Any Body's Information Center, 384 N. Main St., Andover, MA 01810, 617/475-7411. *Macintosh/Apple II.*
Computer Users Group, 7 Muriel Rd., Chelmsford, MA 01824, 617/256-6173. *Macintosh/Apple II.*
North Shore Apple Group, Box 59, Rockport, MA 01966, 617/546-3104. *Macintosh/Apple II.*
East Coast Apple Net, 19 Damon Rd., Scituate, MA 02066, 617/545-2696. *Macintosh only.*
Harvard Computer Society, Science Center 121, 1 Oxford St., Cambridge, MA 02138, 617/498-7937. *University—Macintosh/Apple II.*
Boston College Macintosh User Group, Gasson 12, Boston College, Chestnut Hill, MA 02167, 617/552-8640. *University—Macintosh only.*
Wellesley MUG, Slater International Center, Wellesley College, Wellesley, MA 02181, 617/235-0320. *University—Macintosh only.*
Martha's Vineyard Macintosh User Group, P.O. Box 1602, Edgartown, MA 02539, 508/627-8529. *Macintosh only.*
Cape Cod Apple Users Group, Box 48, South Dennis, MA 02660, 617/896-7286. *Macintosh/Apple II.*

Michigan

S.M.U.G., 4289 Old Forge Dr., Port Huron, MI 48060, 800/521-7660, ext. 275. *Macintosh only.*
Apple PIE, P.O. Box 5055, Warren, MI 48090, 313/778-3299. *Macintosh/Apple II.*
Ann Arbor Apple, P.O. Box 2386, Ann Arbor, MI 48106, 313/485-0884. *Macintosh/Apple II.*
Mac Technics User Group, Box 4063, Ann Arbor, MI 48106, 313/662-1199. *Macintosh only.*
Semco Mac Pac, P.O. Box 02426, Detroit, MI 48202, 313/673-1573. *Macintosh only.*
Mac Group, Box 35529, Detroit, MI 48235. *Macintosh only.*
SE Michigan MUG, 506 Spring Ln., Flushing, MI 48433, 215/368-1678. *Macintosh only.*
The Flint Apple Club, P.O. Box 460, Flint, MI 48501, 313-732-9574. *Macintosh/Apple II.*
Saginaw Apple Computer Klub, 4465 Seidel Pl., Saginaw, MI 48603, 517/792-3975. *Macintosh/Apple II.*
ChUG, 319 S. Chapman, Chesaning, MI 48616, 517/845-2040. *Macintosh only.*
Mac-In-Awe Mug, 1710 W. St. Andrews Rd., Midland, MI 48640, 517/636-0009. *Macintosh only.*
North East Michigan Mac Users Group, 1175 South U.S. 23, Tawas City, MI 48763, 517/362-6149. *Macintosh only.*
Lansing Area Macintosh & Lisa Users, P.O. Box 27372, Lansing, MI 48909, 517/393-6413. *Macintosh only.*
Kalamazoo Apple Computer User, 376 Lodge Ln., Kalamazoo, MI 49009. *Macintosh/Apple II.*
Mar Creek Apple Computer Club, 111 Academy, Battle Creek, MI 49017, 616/963-2885. *Macintosh/Apple II.*
St. Joseph County Apple Computer UG, 55066 N. Fisher Lake Rd., Three Rivers, MI 49093, 616/279-9416. *Macintosh/Apple II.*
Lenawee Apple Core Users Group, 1100 South Main, Lot 61, Adrian, MI 49221, 517/263-2070. *Macintosh/Apple II.*
Albion College Macintosh Enthusiasts, Albion College, Albion, MI 49224, 517/629-5511. *University—Macintosh/Apple II.*
Apple Jackson Users Group, 4848 Wolf Lake Rd., Grass Lake, MI 49240, 517/522-4689. *Macintosh/Apple II.*
Grand Rapids Apple Macintosh Users, 2310 Tecumseh Dr., Grand Rapids, MI 49506, 616/241-3795. *Macintosh only.*
NorthWest Mac Users Group, 131 N. Elmwood, Traverse City, MI 49684, 616/941-6576. *Macintosh only.*
Sault Sainte Marie Macintosh User Group, P.O. Box 154, Sault Sainte Marie, MI 49783, 705/942-8810. *Macintosh only.*
Copper MUG, 600 Hecla St., Box 209, Hancock, MI 49930, 906/482-3907. *Macintosh/Apple II.*

Minnesota

St. Olaf MUG, c/o Blake Sobilloff, St. Olaf College, Northfield, MN 55057, 507/663-3613. *University—Macintosh only.*
Mini'app'les, Box 796, Hopkins, MN 55343, 612/572-9305. *Macintosh/Apple II.*
Univ. of Minn. MUG, 2751 Brighton Ave. NE, Minneapolis, MN 55418, 612/789-0931. *University—Macintosh only.*
Iron Range Apple Computer Club, 2024 Eighth Ave. E, Hibbing, MN 55746, 218/263-5462. *Macintosh/Apple II.*
SMMUG, 2230 Lester River Rd., Duluth, MN 55804, 218/726-2642. *Macintosh only.*
Rochester Area Mac Users, Mayo Clinic E-12, 200 First St. SW, Rochester, MN 55905, 507/282-5182. *University—Macintosh only.*
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Hattiesburg Apple Users Group, 2803 Jefferson Dr., Hattiesburg, MS 39401. *Macintosh/Apple II.*
Apple Users of So. Mississippi, 10 Wingate Dr., Gulfport, MS 39503, 601/831-1473. *Macintosh/Apple II.*
Mississippi State Microcomputer Users, University Computer Center Drawer Cc, Mississippi State, MS 39762, 601/325-2079. *University—Macintosh/Apple II.*

Missouri

Personal Computer Club of St. Louis, 274 Brightfield Dr., Manchester, MO 63021, 314/394-6099. *Macintosh only.*
Gateway Area Macintosh User Group, 907 Lisa Ln., Kirkwood, MO 63122, 314/966-0535. *Macintosh only.*
Applejacks of St. Louis, 12 Jenny Lind Dr., Saint Peters, MO 63376, 314/441-1613. *Macintosh/Apple II.*
Central Missouri Computer Club, c/o Citizen Computer Store, 1905 Walnut St., Higginsville, MO 64037, 816/584-7727. *Macintosh/Apple II.*
Joplin Apple Users Group, 1903 E. 36th, Joplin, MO 64801, 417/624-3900. *Macintosh/Apple II.*
AppleJAC Macintosh Users Group, 2539 Lexington Dr., Jefferson City, MO 65109, 314/634-3102. *Macintosh only.*
Columbia MUG, P.O. Box 811, #1, Columbia, MO 65205, 314/874-8657. *University—Macintosh only.*
Sedalia Apple Users Group, 2316 W. Fifth St., Sedalia, MO 65301, 816/827-2623. *Macintosh/Apple II.*
Apple Squires of the Ozarks, P.O. Box 3986, Springfield, MO 65808, 417/882-0323. *Macintosh/Apple II.*

Montana

Billings Apple Users Group, 231 Alderson Ave., Billings, MT 59106, 406/252-7581. *Macintosh/Apple II.*
Montana Mac, 3211 Fifth Ave. S, Great Falls, MT 59405, 406/761-8954. *Macintosh only.*
NONS, Box 521, Choteau, MT 59422, 406/466-2857. *Macintosh/Apple II.*
Montana Macademics, Department of English, Montana State University, Bozeman, MT 59717, 406/994-5189. *University—Macintosh only.*

Nebraska

Omaha Macintosh Users Group, 311 S. 151st Circle, Omaha, NE 68154. *Macintosh only.*
Metro Apple Computer Hobbyists, 3506 N. 113th Plaza, #1, Omaha, NE 68164, 402/493-3259. *Macintosh/Apple II.*
Lincoln Informed Macintosh Enthusiasts, 5521 Locust St., Lincoln, NE 68516, 402/489-0556. *Macintosh only.*
Platte Valley User's Group, 601 Park St., Scottsbluff, NE 69361, 308/635-0730. *Macintosh/Apple II.*

Nevada

Southern Nevada Apple Family User, Box 8551, 5000 E. Bonanza, Las Vegas, NV 89110. *Macintosh/Apple II.*
Greater Reno Operating Group, Box 1038, Sparks, NV 89432, 702/355-7676. *Macintosh/Apple II.*

New Hampshire

Southern NH Apple Core, Drawer 3647, Nashua, NH 03061, 603/883-1655. *Macintosh/Apple II.*
Pemi-Baker Computer Users Group, RFD 2, Box 399, Plymouth, NH 03264, 603/536-3880. *Macintosh/Apple II.*
Mac Monadnock MUG, 601 West St., Keene, NH 03431, 603/357-4531. *Macintosh only.*
Big Green Apple Users Group, Stevens Rd., Box 180, Etna, NH 03750, 603/643-2530. *Macintosh/Apple II.*
Seacoast Mac, 57 South St., Portsmouth, NH 03801, 603/436-1608. *Macintosh only.*
The Apple Manchester User Group, 663 Varney St., Manchester, NH 03833, 617/778-7229. *Macintosh/Apple II.*
Merrimac Macintosh User Group, 20 Johnson Meadow Rd, #4A, Hampstead, NH 03841, 603/329-6107. *Macintosh only.*
Lakes Region Mac Users Group, P.O. Box 92, New Durham, NH 03855, 603/859-3342. *Macintosh only.*

New Jersey

Summit Mac User Group, 42 Oakview Ave., Maplewood, NJ 07040, 201/763-3360. *Macintosh only.*
New Jersey Macintosh Users Group, P.O. Box 43205, Upper Montclair, NJ 07043. *Macintosh only.*
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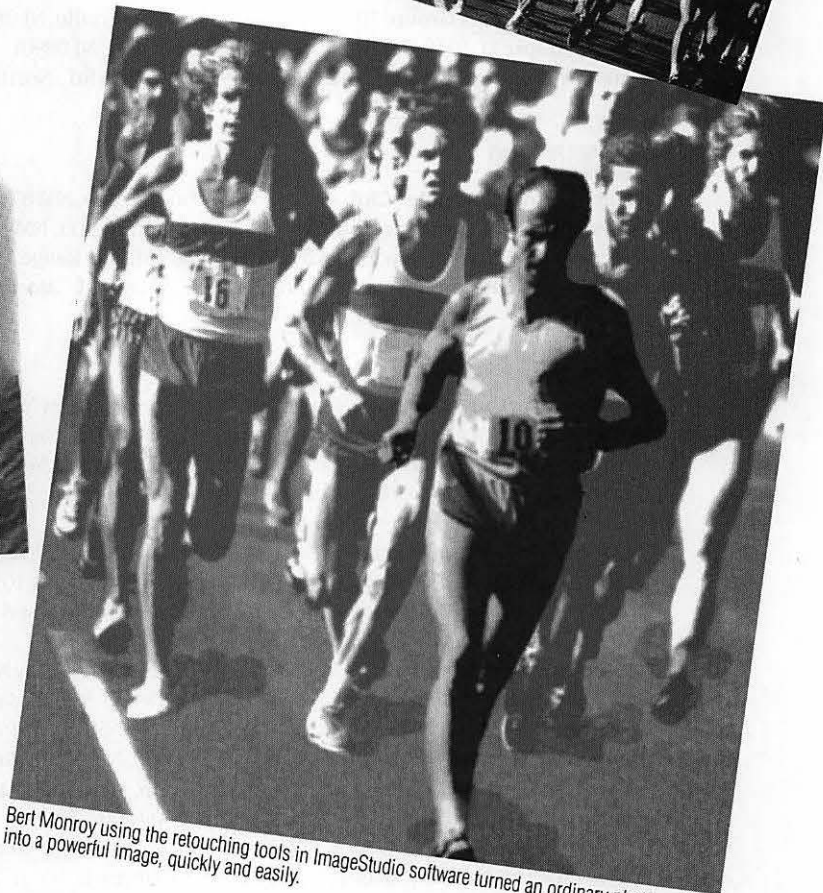
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Central Jersey Macintosh User Group, 217 Mawbey St., Woodbridge, NJ 07095, 201/750-1988. *Macintosh only.*
Bergen County Macintosh Users Group, 147 N. Terrace Pl., New Milford, NJ 07646, 201/262-6729. *Macintosh only.*
Columbia University Mac Users Group, 572 Kenwood Pl., Teaneck, NJ 07666, 201/836-2529. *University-Macintosh only.*
Golden Apple Users Group, 2 Bayberry Ln., Randolph, NJ 07869, 201/263-8330. *Macintosh/Apple II.*
NW Jersey Apple Users Group, 23 Rt. 206, Stanhope, NJ 07874, 201/347-7892. *Macintosh/Apple II.*
Apple Jack, Box 634, Madison, NJ 07940, 201/822-3131. *Macintosh/Apple II.*
South Jersey Apple Users Group, P.O. Box 4273, Cherry Hill, NJ 08003, 609/482-0457. *Macintosh/Apple II.*
South Jersey Mac Users, 221 Timothy Ct., Cherry Hill, NJ 08034, 609/428-4429. *Macintosh only.*
Ocean Apple Users Group, 1049 Driftwood Ave., Manahawkin, NJ 08050, 609/597-3797. *Macintosh/Apple II.*
Atlantic City Area Mac Users Group, 201 Tilton Rd., Northfield, NJ 08225, 609/646-8151. *Macintosh/Apple II.*
Princeton Macintosh Users' Group, 6 New South, Info Services, Princeton, NJ 08544, 609/452-3622. *University-Macintosh only.*
Monmouth Apple Corps User Group, 332 River Ave., Point Pleasant Beach, NJ 08742, 201/528-6349. *Macintosh/Apple II.*
Macintosh Assoc. of Central New Jersey, RD 1, Box 250, Milford, NJ 08848, 201/852-2205. *Macintosh only.*
Ewing Apple Users Group, 703 E. Brookside Ln., Somerville, NJ 08876, 201/874-8766. *Macintosh/Apple II.*
Apple Synapse II, 1050 George St. 5-0, New Brunswick, NJ 08901. *Macintosh/Apple II.*
Amateur Computer Group of New Jersey, 698 Magnolia Rd., North Brunswick, NJ 08902, 201/563-5389. *Macintosh only.*

New Mexico

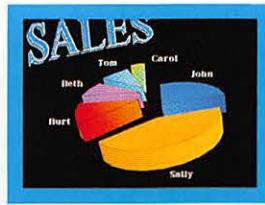
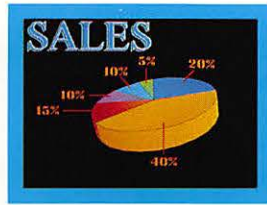
Applequerque Computer Club, Box 35508, Albuquerque, NM 87176, 505/888-4410. *Macintosh/Apple II.*
Red Apple Flyer Computer Club, 4108 Douglas, Farmington, NM 87401. *Macintosh/Apple II.*
Cruces Apple Users Group, Box 428, White Sands Missile Range, NM 88002, 505/522-0861. *Macintosh/Apple II.*
Apples-on-the-Pecos, 27 Lost Trail Rd., Roswell, NM 88201. *Macintosh/Apple II.*

New York

New York Mac Users Group, 688 Avenue of the Americas, New York, NY 10010, 212/691-0496. *Macintosh only.*
Westchester MUG, 41 Park Ave., #2G, New York, NY 10016. *Macintosh only.*
Mt. Sinai Apple Users Group, Box 1115, 1 Gustave Levy Plaza, New York, NY 10029, 212/241-6151. *University-Macintosh/Apple II.*
City MUG, City of New York Associated Student Union Center, 33 W. 42nd St., Box 220, New York, NY 10036, 212/790-4360. *University-Macintosh only.*
Big Apple Users Group, Box 490, New York, NY 10274, 718/442-4256. *Macintosh/Apple II.*
Staten Island Apple User Group, Box 050 141, Staten Island, NY 10305, 718/727-1291. *Macintosh/Apple II.*
Bronx Community College Mac Users, University Heights, 181st & University Aves., Bronx, NY 10453, 212/220-6235. *University-Macintosh only.*
Westchester Apple Group, 55-A Locust Ave., #4G, New Rochelle, NY 10801, 914/636-3417. *Macintosh/Apple II.*
Rock Mug, RD 2, Box M781, Monroe, NY 10950, 914/638-3800. *Macintosh only.*
Crab Apple, 14 Eleanor Pl., Monsey, NY 10952, 212/822-5035. *Macintosh/Apple II.*
Apple Power Users Group, Box 490, Franklin Square, NY 11010, 516/775-8841. *Macintosh/Apple II.*
Nassau Community College Macintosh User Group, Math/Computer Department, Nassau Community College, Garden City, NY 11530, 516/222-7384. *University-Macintosh/Apple II.*
Fran-Apple User Group, P.O. Box 172, East Meadow, NY 11554. *Macintosh/Apple II.*
Suffolk Macintosh Users' Group, P.O. Box 233, Centereach, NY 11720, 516/231-1919. *Macintosh only.*
Lica-Limacintosh Users Group, Box 518, Seaford, NY 11783, 516/541-3186. *Macintosh only.*
Campus Apple Group, 2214 12th St., Troy, NY 12180, 518/271-0750. *University-Macintosh/Apple II.*
Northeastern Users of the Mac, Inc., P.O. Box 2548 ESP, Albany, NY 12220. *Macintosh only.*
Society of Hudson Valley Mac Users, Box 1999, Kingston, NY 12401. *Macintosh only.*
Valley Central MUG, c/o Marietta Allen, 29 Colden Hill Rd., Newburgh, NY 12550, 914/457-3124. *Macintosh only.*
Skidmore Mac Enthusiasts, Computer Services, Skidmore College, Saratoga Springs, NY 12866, 518/584-5000. *University-Macintosh only.*
Upstate Cider Mill, RR 3, Box 25B, Caughdenoy Rd., Central Square, NY 13036, 315/676-2446. *Macintosh only.*
Syracuse Microcomputer Club, RR 1, Box 175, Fabius, NY 13063, 315/683-9460. *University-Macintosh/Apple II.*
The Apple Corps, 55 Stevenson St., #5, Seneca Falls, NY 13148, 315/568-9718. *Macintosh/Apple II.*
SUNY-ESF Mac Users Group, Room 8 LLRC, College of Environmental Science and Forestry, Syracuse Campus, Syracuse, NY 13210, 315/470-6810. *University-Macintosh only.*

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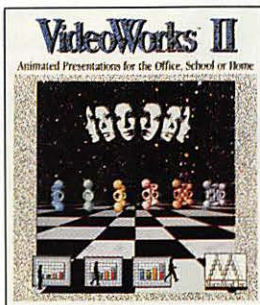
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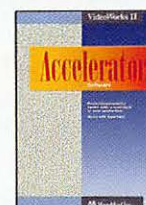
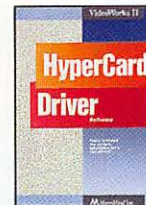
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Syracuse Apple Users Group, Box 6586, Teal Avenue Station, Syracuse, NY 13217, 315/677-3660. *Macintosh/Apples II.*

Colgate Macintosh Users Group, Box K2009, Colgate University, Hamilton, NY 13346, 315/824-9877. *University—Macintosh only.*

Mac-RUG, 113 Glen Rd. S, Rome, NY 13440, 315/336-8060. *Macintosh/Apples II.*

Upstate Apple Users Group, RD 1, Box 17-A, 99 Commercial Dr., Whitesboro, NY 13492, 315/793-5911. *Macintosh/Apples II.*

Potsdam College Mac Users, 5 Missouri Ave., Potsdam, NY 13676, 315/265-2396. *University—Macintosh/Apples II.*

MUG One, 2 Walling Blvd., Oneonta, NY 13820, 607/432-0131. *Macintosh only.*

STAC, 1968 North Rd., Vestal, NY 13850. *Macintosh/Apples II.*

Southern Tier Apple Core, 98 Oak St., Binghamton, NY 13905, 607/529-8880. *Macintosh/Apples II.*

Rainbow Country User Group, 2850 Daniels Rd., Wilson, NY 14172. *Macintosh only.*

Apple Byters' Corps, Inc., 42 Moeller St., Buffalo, NY 14211, 716/695-5857. *Macintosh/Apples II.*

Rochester Apple CIDER, 75 Wood Creek, Pittsford, NY 14534. *Macintosh/Apples II.*

Banana Byte User Group, 29 Chartwell Ct., Rochester, NY 14623, 716/475-3672. *University—Macintosh/Apples II.*

MacRIT, College Alumni Union, Room A295, One Lomb Memorial Dr., Rochester, NY 14623,

716/475-2054. *University—Macintosh only.*

Apple-Ace Computer Club, 92 Elm Grove Rd., Rochester, NY 14626, 716/225-8850. *Macintosh/Apples II.*

MUGUR, University of Rochester, Box 29052, Rochester, NY 14627, 716/275-1485. *University—Macintosh only.*

Mugwump, Computer Services—Uris Hall, Cornell University, Ithaca, NY 14853, 607/255-8321. *University—Macintosh only.*

North Carolina

Triad Apple Core, P.O. Box 1710, Greensboro, NC 27402, 919/725-7860. *Macintosh/Apples II.*

University of North Carolina MUG, P.O. Box 907, Carrboro, NC 27510, 919/962-3601. *University—Macintosh only.*

Apple Seeds, P.O. Box 28623, Raleigh, NC 27611, 919/779-3519. *Macintosh only.*

Greenville Mac User Group, 125 Greenwood Dr., Greenville, NC 27834, 919/551-4440. *Macintosh only.*

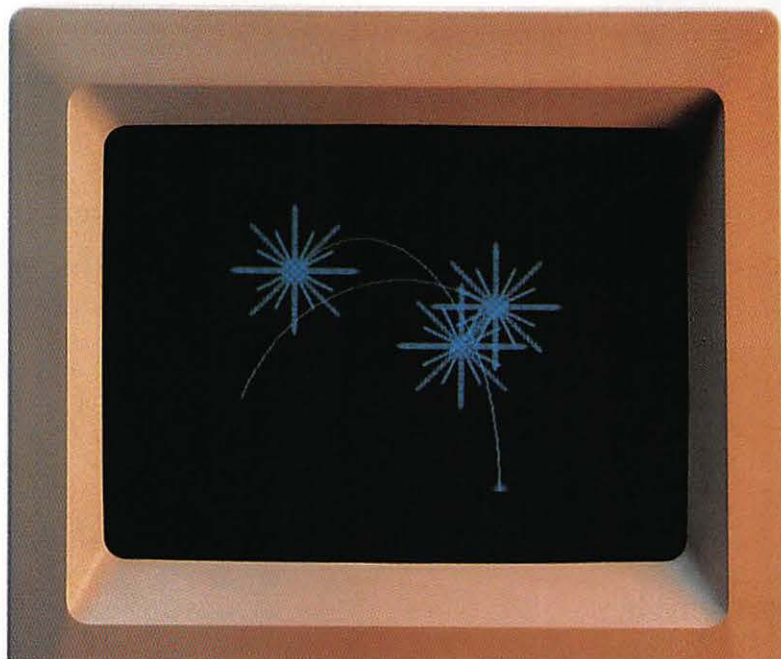
Davidson Apple User's Group, P.O. Box 2251, Davidson, NC 28036. *University—Macintosh/Apples II.*

Charlotte Apple Computer Club, P.O. Box 221913, Charlotte, NC 28222, 704/542-8596. *Macintosh/Apples II.*

Fayetteville Macintosh Users' Group, Box 42224, Fayetteville, NC 28309, 919/484-1424. *Macintosh/Apples II.*

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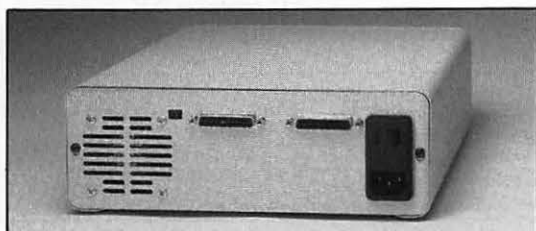
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User Groups Directory

Macintosh Apple Corp of Wilmington, 2840 S. College Rd., #320, Wilmington, NC 28403. *Macintosh only.*
Catawba Valley Byte 32, UG, Rt. 1, Box 540-19ab, Conover, NC 28613, 704/256-7035. *Macintosh only.*
Brass Apple Users Group, Rt. 1, Box 158, Murphy, NC 28906, 704/837-8035. *Macintosh/Apples II.*

North Dakota

G.E. Apple S.A.U.C.E., 1804-A I St., Grand Forks Air Force Base, ND 58205, 701/594-5542. *Macintosh/Apples II.*
Apple Polisher, 1112 Glacial Dr., Minot, ND 58701, 701/838-6444. *Macintosh/Apples II.*
Minot Macintosh Users, 2600 23rd St. SW, Minot, ND 58701, 701/857-6183. *Macintosh only.*

Ohio

Buckeye Macintosh Group, 2041 College Rd., Ohio State University, Department of Ceramic Engineering, Columbus, OH 43210, 614/626-6209. *University—Macintosh only.*
Central Ohio Apple Computer Hobbyists, 4351 Apley Pl., Columbus, OH 43229, 614/475-1271. *Macintosh/Apples II.*
Bowling Green Macintosh User Group, College of Technology, Bowling Green State University, Bowling Green, OH 43403, 419/372-6005. *University—Macintosh only.*
University of Toledo Macintosh Users, Carver Education Center, University of Toledo, Toledo, OH 43606, 419/537-2835. *Macintosh/Apples II.*
Zanesville Area Macintosh Users Group, 930 Garden Rd., Zanesville, OH 43701, 614/452-6289. *Macintosh only.*
Tri-State Computer Association, 142 Susan Dr., Wintersville, OH 43952, 614/264-7006. *Macintosh/Apples II.*
OMUG, c/o Dan Handalain II, OOMR 1240, Oberlin, OH 44074. *University—Macintosh only.*
CWRU Macmug, c/o Tom Evans, Business Office, School of Medicine, Case Western Reserve University, Cleveland, OH 44106, 216/368-2011. *University—Macintosh only.*
North Coast Mac Users Group, 21190 Erie Rd., Rocky River, OH 44116, 216/835-3636. *Macintosh only.*
NEO Apple Corps, 31481 Cedar Rd., Mayfield Heights, OH 44124, 216/953-6083. *Macintosh/Apples II.*
Mahoning Valley Apple Computer, 5066 Mahoning Ave. NW, Warren, OH 44483, 216/847-9223. *Macintosh/Apples II.*

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Country Computer Club, 530 High St., Wooster, OH 44691, 216/264-9285. *Macintosh/Apples II.*
COW Macintosh Users Group, Box C-3162, College of Wooster, Wooster, OH 44691, 216/263-2444. *University-Macintosh only.*
Mac2, Box 35693, Canton, OH 44735, 216/494-4074. *Macintosh only.*
Apple Jack Users Group, 331 S. Market St., Galion, OH 44833, 419/468-3542. *Macintosh/Apples II.*
North Coast Computer Users, P.O. Box 2055, Sandusky, OH 44870, 419/625-6200. *Macintosh/Apples II.*
MACincinnati, 1642 Pullan Ave., Cincinnati, OH 45223, 513/741-4329. *Macintosh only.*
Apple Siders of Cincinnati, Box 14277, Cincinnati, OH 45250, 513/741-4329. *Macintosh/Apples II.*
Antioch Mac Users Group, Antioch College, Yellow Springs, OH 45387, 513/767-7331. *University-Macintosh only.*
Apple-Dayton Users Group, P.O. Box 3240, Dayton, OH 45401, 513/293-8114. *Macintosh/Apples II.*
Athens Apple Users Group, 31 Central Ave., Athens, OH 45701, 614/592-2202. *University-Macintosh/Apples II.*
Findlay Apple Computer Club, 7426 TR 136, Findlay, OH 45840, 419/424-0401. *Macintosh/Apples II.*

Oklahoma

The Big Red Apple Group, P.O. Box 3077, Norman, OK 73070, 405/329-2952. *Macintosh/Apples II.*
Oklahoma City Apple Users Group, Box 19561, Oklahoma City, OK 73144, 405/681-0397. *Macintosh/Apples II.*
Tish Apple, Murray State College Library, Tishomingo, OK 73460, 405/371-2371. *University-Macintosh/Apples II.*
Southwest Oklahoma Apple Orchard, Box 6646, Lawton, OK 73506, 405/536-9365. *Macintosh/Apples II.*
Altus Apple Users Group, 609 Taft St., Altus, OK 73521, 405/477-1533. *Macintosh/Apples II.*
Enid Appleseeds, Rt. 1, Box 8, Douglas, OK 73733, 405/234-3382. *Macintosh/Apples II.*
Bartlesville Users of Macintosh Society, 6523 Trail Dr., Bartlesville, OK 74006, 918/333-6536. *Macintosh only.*
G.C.C.A., P.O. Box 497, Tulsa, OK 74101, 918/749-8804. *Macintosh/Apples II.*
Tulsa Users of Macintosh Society, Box 470564, Tulsa, OK 74147, 918/438-3851. *Macintosh only.*

Oregon

Hood River Apples User Group, 3553 Dethman Ridge, Hood River, OR 97031, 503/354-1233. *Macintosh/Apples II.*
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User Groups Directory

Oregon Apple II User Group, c/o Arthur Young & Company, 1001 S.W. Fifth Ave., #2000, Portland, OR 97204, 503/225-1623. *Macintosh/Apple II.*

Portland Macintosh Users Group, Box 8895, Portland, OR 97207, 503/228-1779. *Macintosh only.*

Macintosh Business Group of Oregon, 10240 S.W. Nimbus Ave., #L-11, Tigard, OR 97223, 503/620-0866. *Macintosh only.*

Salem Macintosh Users Group, Water Resources Dept., Resource Management, 3850 Portland Rd. NE, Salem, OR 97310, 503/399-9411. *Macintosh only.*

MUG of Corvallis, 520 N.W. Oak, Corvallis, OR 97330, 503/753-1040. *Macintosh only.*

Oregon Coast MUG, Hatfield Marine Science Center, Newport, OR 97365, 503/867-3011. *Macintosh only.*

Eugene Macintosh Group, Box 10988, Eugene, OR 97440, 503/683-5565. *Macintosh only.*

Apple Blossom Club, Box 638, Winston, OR 97496, 503/679-8458. *Macintosh/Apple II.*

Mac Users of the Rogue Valley, 181 Rustic Canyon Dr., Grants Pass, OR 97526, 503/479-0642. *Macintosh only.*

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Pittsburgh Apple Business Users Group, 1317 Corkwood Dr., Monroeville, PA 15146, 412/373-3903. *Macintosh only.*

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Bottom of Barrel, 2613 Eighth Ave., #3b, Altoona, PA 16602, 814/946-1423. *Macintosh/Apple II.*

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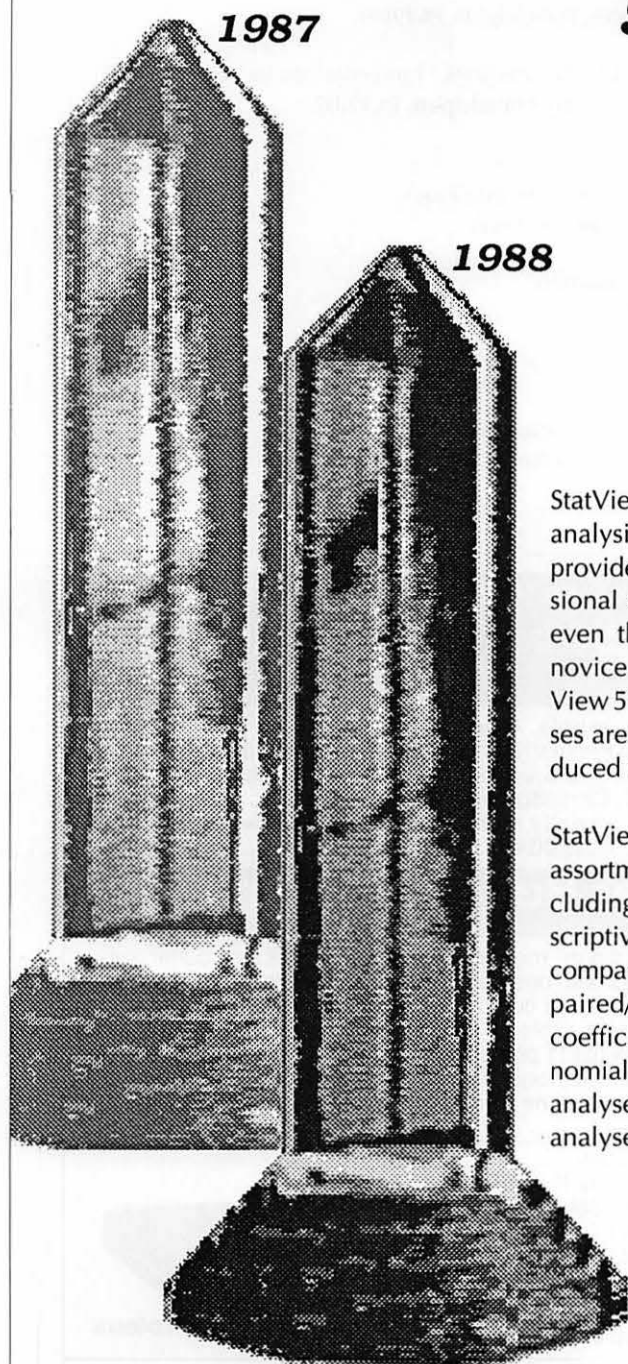
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PennMUG, Box 952, Carlisle, PA 17013, 717/243-5838. *Macintosh only.*
Hershey Apple Core, Box 634, Hershey, PA 17033, 717/838-2952. *Macintosh/Apple II.*
Lancaster County Apple Corps, 249 Julia Ave., Strasburg, PA 17579, 717/687-8574. *Macintosh/Apple II.*
Franklin & Marshall Macintosh User Group, Franklin & Marshall College, Lancaster, PA 17604. *University-Macintosh only.*
Lehigh Valley Macintosh User Group, 505 Forrest Ave., Bethlehem, PA 18017, 215/691-1125. *Macintosh only.*
Eastern Pennsylvania Macintosh User Group, 243 Spring Garden St., Easton, PA 18042, 215/253-4380. *Macintosh only.*
MUG Shop, Box 388, Southampton, PA 18966, 215/464-4763. *Macintosh only.*
DUsers, James Creese Student Center, 32nd & Chestnut Sts., Drexel University, Philadelphia, PA 19104, 215/895-2573. *University-Macintosh only.*
DV&DUMUG, c/o Melanie Hoag, Drexel University, Office of Computing Services, Philadelphia, PA 19104, 215/895-2997. *University-Macintosh only.*
PennMUG, 1202 Blockley Hall, University of Pennsylvania, Philadelphia, PA 19104, 215/898-9085. *University-Macintosh only.*
Jefferson Macintosh User's Group, 561 Thompson Bldg., Thomas Jefferson University, Philadelphia, PA 19107, 215/928-8655. *University-Macintosh only.*
Chester County Computer Club, Normandy Circle, Glenmoore, PA 19343. *Macintosh/Apple II.*
Great Valley Macintosh Users Group, 9 Lloyd Ave., Malvern, PA 19355, 215/644-3997. *Macintosh only.*
AntMUG, P.O. Box 157, Plymouth Meeting, PA 19462, 215/279-5912. *University-Macintosh only.*
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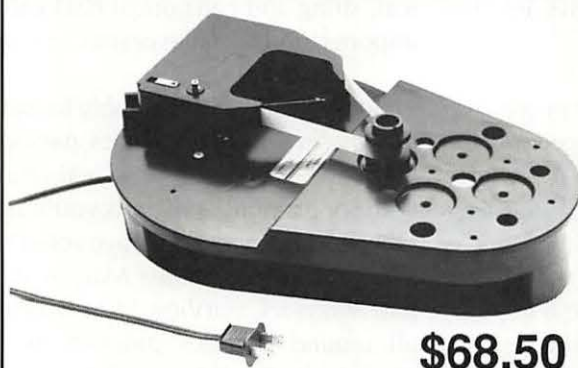
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BrUMUG, Box D, Brown University, Providence, RI 02912, 401/863-1419. *University-Macintosh only.*
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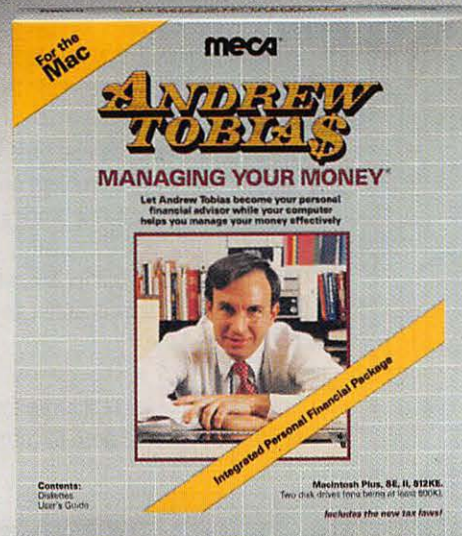
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MUSC Mac User Group, 171 Ashley Ave., Charleston, SC 29425, 803/792-2486. *University-Macintosh only.*
Coastal Macs, 1018-A S. Hollywood Dr., Surfside Beach, SC 29575, 803/626-9856 (Fred). *Macintosh only.*
Mac 1, 4614 Old Spartanburg Rd. #8PV, Taylors, SC 29687, 803/268-9667. *Macintosh only.*

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Team Mac, P.O. Box 203, Yankton, SD 57078, 605/665-5177. *Macintosh only.*
Apple Core of Siouxland, Box 90002, Sioux Falls, SD 57105, 605/339-7115. *Macintosh/Apples II.*
Black Hills Apple Users Group, 719 N. Maple, Rapid City, SD 57701, 605/348-9173. *Macintosh/Apples II.*

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MacInterests, 235 Lauderdale Rd., Nashville, TN 37205, 615/327-1757. *Macintosh only.*
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Apple Tree, 2805 Del Norte, Temple, TX 76502, 817/771-4524. *Macintosh/Apple II.*
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New Braunfels Apple User Group, 165 Bobolink, New Braunfels, TX 78130, 512/625-1314. *Macintosh/Apple II.*
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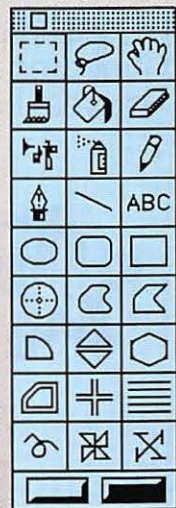
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Panhandle Apple Club, Box 30878, Amarillo, TX 79120, 806/373-9478. *Macintosh/Apple II.*
Big Red Apple Group, 4402 Catrock Rd., Abilene, TX 79606, 915/698-0329. *Macintosh/Apple II.*
Click Clique, 708 W. Pine Ave., Midland, TX 79705, 915/682-4305. *Macintosh only.*
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Ogden Apple Users Group, P.O. Box 4035, Ogden, UT 84403, 801/776-0164. *Macintosh/Apple II.*
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Lynchburg Computer Society, Box 2073, Lynchburg, VA 24501. *Macintosh/Apples II.*
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MacAnt, Antioch University, 2607 Second Ave., Seattle, WA 98121, 206/441-5352. *University—Macintosh/Apples II.*
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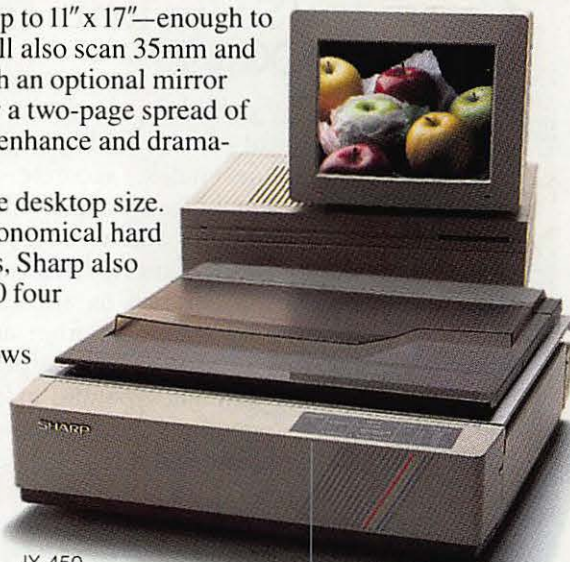
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509/335-9531. *University—Macintosh/Apple II.*

North Idaho Mac Users Group, W. 927 Glass, Spokane, WA 99205, 509/328-4974. *Macintosh only.*

Macs, N. 1010 Bates, Spokane, WA 99206, 509/467-2400. *Macintosh only.*

Mid Columbia Macs, 523 N. Nevada St., Kennewick, WA 99336, 509/375-3797. *Macintosh only.*

Computer Literacy & Support Society, P.O. Box 335, Pomeroy, WA 99347, 509/843-3542. *Macintosh/Apple II.*

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Watertown Macintosh Users Group, Box 354, Watertown, WI 53094. *Macintosh only.*

Pro-Mac, c/o Green Associates, 520 S. Second St., Box 464, Delavan, WI 53115, 414/728-4300. *Macintosh only.*

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Double Click MUG, 3016 N. Summit Rd., Milwaukee, WI 53211, 414/964-3147. *Macintosh only.*

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UWSP MacGroup, P.O. Box 21, College of Prof. Studies-UWSP, Stevens Point, WI 54481, 715/346-4436. *University—Macintosh only.*

Apple Personnel Prog. & Learning, c/o Cbm Computers, 3521 Eighth St. S, Wisconsin Rapids, WI 54494, 715/424-2131. *Macintosh/Apple II.*

La Crosse Apple Users Group, 711 Division St., La Crosse, WI 54601, 608/784-9162. *Macintosh/Apple II.*

Madison Macintosh Users' Group, Box 1522, Madison, WI 53701, 608/251-2885. *Macintosh only.*

Eau Claire Apple Users Group, Box 61, Eau Claire, WI 54702, 715/723-1301. *Macintosh/Apple II.*

Chippewa Falls Macintosh Users Group, 1020 Olive St., Chippewa Falls, WI 54729, 715/723-2256. *Macintosh only.*

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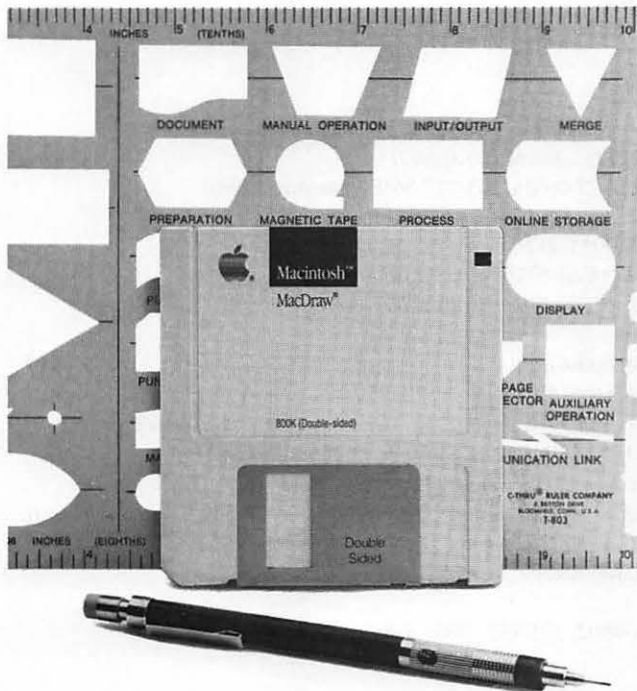
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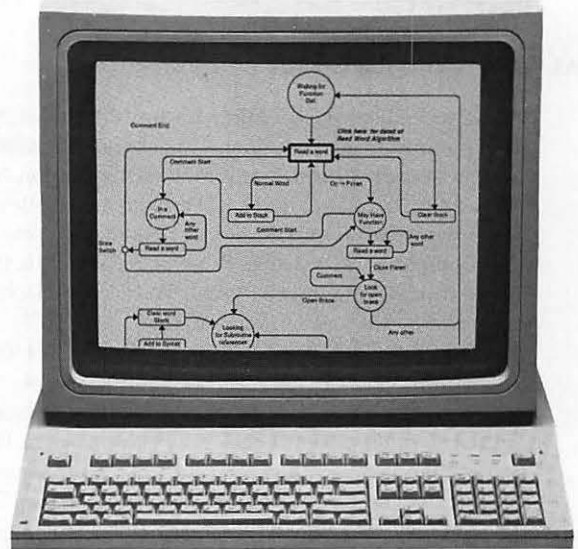
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Casper Area Macintosh User Group, P.O. Box 80, Casper, WY 82602, 307/266-0570. *Macintosh only.*
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Mac Engineering User Group, 1035 Tantra Park Circle, Boulder, CO 80303. *Macintosh only.*
Macintosh Construction Forum, P.O. Box 1272, Sandpoint, ID 83864. *Macintosh only.*
Aviation & Computer Enthusiasts, 2009 Camelot Dr., Las Cruces, NM 88005, 505/526-5645. *Macintosh/Apple II.*
Macintosh Entertainment Guild of America, 1032 N. Sycamore St., Hollywood, CA 90065, 213/653-0240. *Macintosh only.*
UCSD Pascal User Society, P.O. Box 1148, La Jolla, CA 92038, 303/526-0057. *Various computers.*
The Realtors Mac User Group, 18023 Sky Park Circle, #F-2, Irvine, CA 92714, 714/261-1930. *Macintosh only.*
Apple Professional Exchange, 1142 Stonylake Ct., Sunnyvale, CA 94086, 408/745-0665. *Macintosh only.*
Christian Macintosh User Group, 1737 N. First St., #300, San Jose, CA 94112, 408/437-1913. *Macintosh only.*
Focus, the Computer Society for Doctors, P.O. Box 15579, San Francisco, CA 94115. *Various computers.*
The Disabled Children's Computer Group, 2095 Rose St., Berkeley, CA 94709. *Macintosh/Apple II.*
Apple HyperCard User Group, 20525 Mariani Ave., MS 27AN, Cupertino, CA 95014, 408/974-1707. *Macintosh only.*
National Assn. Blind & Vis. Impaired, P.O. Box 1352, Roseville, CA 95661, 916/782-5518. *Macintosh/Apple II.*
MacApp Developer's Association, Box 23, Everett, WA 98206, 206/252-6897. *Macintosh only.*

NATIONAL USER GROUPS

Boston Computer Society, One Center Plaza, Boston, MA 02108, 617/367-8080. *Various computers.*
Boston Computer Society Mac User Group, 48 Grove St., Somerville, MA 02144, 617/625-7080. *Macintosh only.*
Apple Ambassadors Information Network, P.O. Box 416, Mountain Rd., Raymond, NH 03077, 603/895-3009. *Macintosh/Apple II.*
Information clearinghouse for user groups.
Apple Users Group International, P.O. Box 913, Langley Air Force Base, VA 23665, 804/764-7686. *Macintosh/Apple II.*
National Lisa & Macintosh Users Group, Box 450676, Miami, FL 33245, 305/385-1203. *Macintosh only.*
Tau, 1113 Wheaton Oaks Dr., Wheaton, IL 60187, 312/653-7640. *Macintosh/Apple II—Business focus.*
BMUG, 1442A Walnut St., #62, Berkeley, CA 94709, 415/849-9114. *Macintosh only.*
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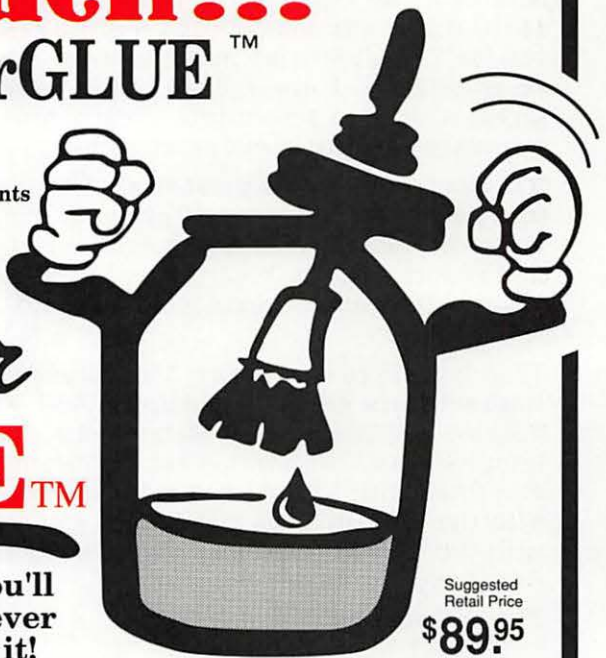
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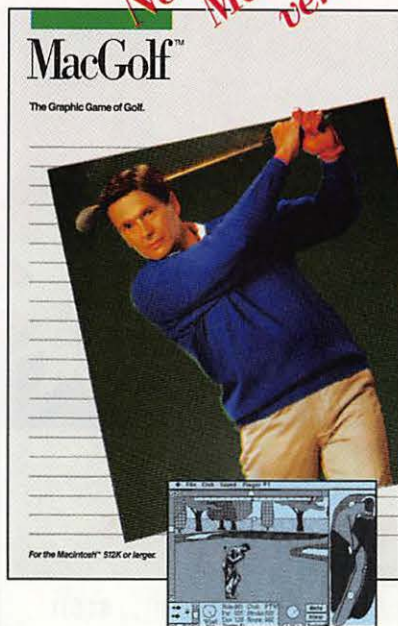


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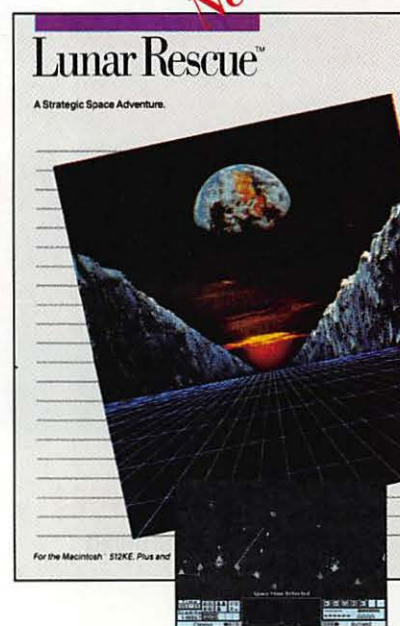
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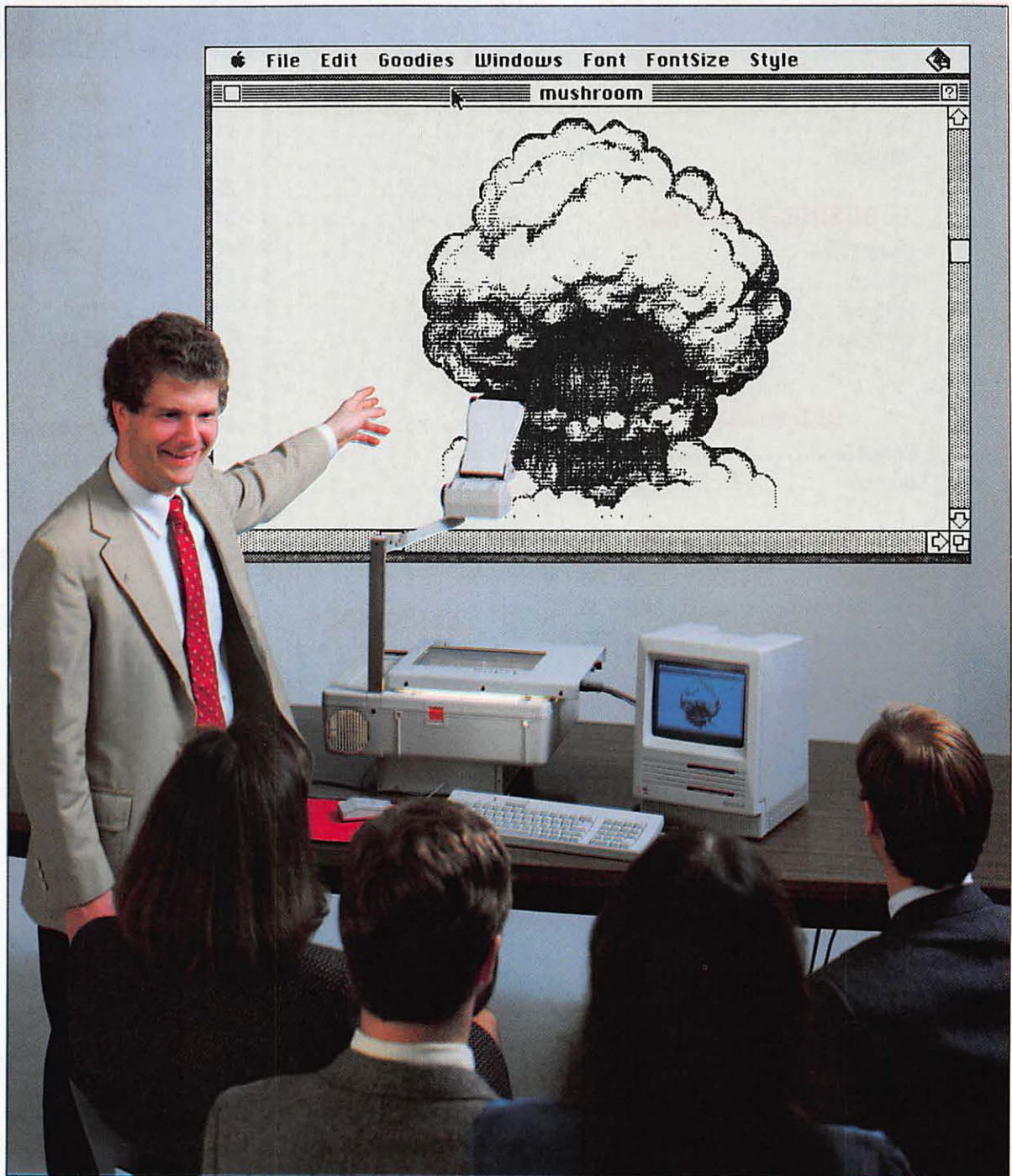
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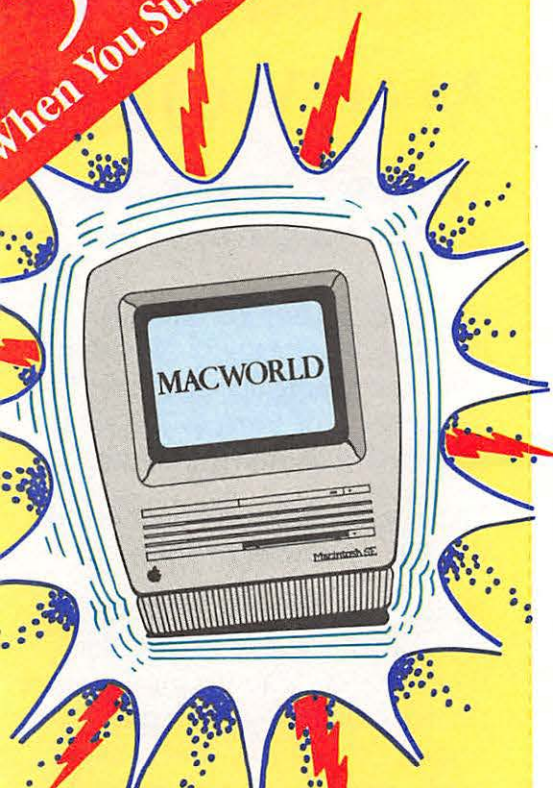
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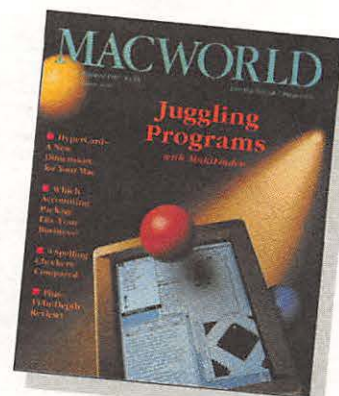
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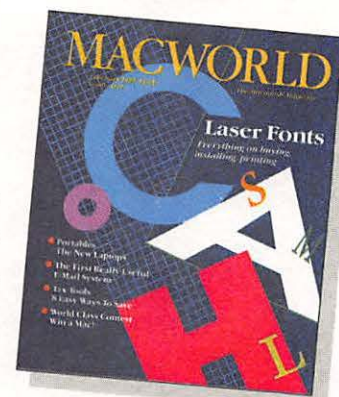
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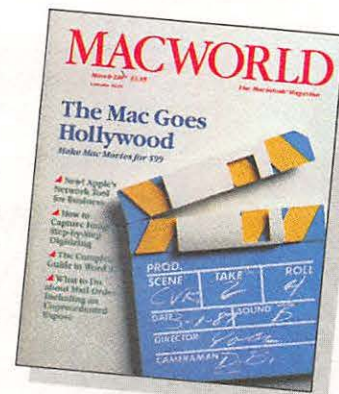
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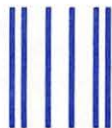
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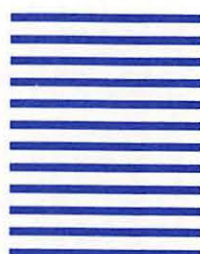
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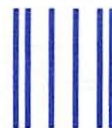
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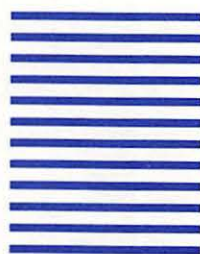
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Updates

This list brings you the highlights of software updates recently received but not yet tested. The first price is the upgrade cost for registered owners; the second is the current list price.

Accountant, Inc. version 2.1 adds MultiFinder compatibility, streamlined journal entries, automatic cash refunds with credit memos, full LaserWriter compatibility for forms and reports. New documentation includes reference and tutorial manuals. SoftSync, Inc., 162 Madison Ave., New York, NY 10016, 212/685-2080. \$9.50; \$49.95 new.

Adobe Illustrator 88 adds freehand and autotrace tools for bitmapped images, blending (or interpolation) tool, and resolution-independent pattern-fill feature. Can create on-screen color images. Provides over 700 Pantone colors on screen. Creates color separations and prints on QMS ColorScript 100. Adobe Systems Inc., 1585 Charleston Rd., Mountain View, CA 94039, 415/961-4400. Free if purchased after January 14, 1988, otherwise \$100; \$495 new.

Aztec C version 3.6 offers full MPW support. Other new features include a choice of diff and grep as well as compare and search; MultiFinder compatibility; cc and as, which generate diagnostics executable by the MPW shell; command scripts for tools; multiple language support in the linker; and an expansion of the standard library. Manx Software Systems,

Inc., 1 Industrial Way, Eatontown, NJ 07724, 201/542-2121, 800/221-0440. Upgrade \$60, upgrade and SDB (Source Level Debugger) \$99; Aztec C68k/MPW Professional \$175 new; Aztec C68k/Mac SDB \$175; Aztec C68k/Mac UniTools \$120; Aztec C68k/Developer (includes MPW Professional and UniTools) \$295; Aztec C68k/B-Shell (uses Manx shell rather than MPW's) \$120; Library Source reduced to \$250.

Card/Fax 1988 (Topps, Donruss, and Fleer packages) can be merged with user's existing Topps, Donruss, or Fleer program to automatically replace each card's previous value with its current market price. Compu-Quote, 6914 Berquist Ave., Canoga Park, CA 91307, 818/348-3662, 800/782-6775. \$25 plus \$1.50 s/h; first package \$95, each subsequent one \$45.

Disk Tools Plus is now compatible with MultiFinder. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, 415/571-7171. Free when downloaded from CompuServe; \$18 with return of battery pack disk; \$49.95 new.

Dollars & Sense version 4.1b's enhancements include new database engine, improvements in transaction entry, a fully nonmodal format, tiered accounts, and preservation of two years of data for comparisons and budgeting. Monogram Software, Inc., 531 Van Ness Ave., Torrance, CA 90501, 213/533-5120. Free if purchased after August 1, 1988, otherwise \$49.95; \$149 new.

DS Backup version 4.0 backs up hard disks up to 25 percent faster than earlier versions and can copy data from one hard disk to another. Design Software, Inc., 1275 West Roosevelt Rd., West Chicago, IL 60185, 312/293-7271. \$29.95 with s/h; \$69.95 new.

M version 2.0 allows easier manipulation of screen controls, interactive pattern editing, and automatic conducting. Includes record modes, which interpret MIDI input in a variety of ways; time distortion, which allows for rhythmic nuance; snapshot quantization and slideshows, which allow a user to record control settings and performance gestures; and complete MIDI file capability. MultiFinder and Mac II compatible. Intelligent Music, P.O. Box 8748, Albany, NY 12208, 518/434-4110. Free; \$250 new.

MacGolf version 3.0 runs on the Mac II. Supports 16-color graphics and is compatible with many large-screen monitors. Includes six golf courses, nine practice greens, a practice range, and Top Ten Golfers record, as well as five enlargement options for close-up views, a slope direction indicator, and command keys for selecting clubs. Can be installed on a hard disk. Practical Computer Applications, 1305 Jefferson Hwy., Champlin, MN 55316, 612/427-4789. \$5 shipping fee for owners of both MacGolf and MacCourses; \$34.95 plus \$5 s/h for MacGolf owners; \$59.95 new.

(continues)

MacLinkPlus version 2.11 revises and enhances each of the translators in the MacLink Plus library. MS Word and Word Perfect added to library of word processing translators. Can now expand translation range of Apple File Exchange utility (for use with 5¼-inch disk drive). Mac-to-Mac communications accomplished through a serial cable or modems. Increased communications feed for final transfer to 57,600 baud. Data Viz Inc., 35 Corporate Dr., Trumbull, CN 06611, 203/268-0030. Free if purchased after October 1, 1987, \$15 for new manual; \$30 if purchased before October 1, 1987, \$45 with manual; \$195 new.

MacPerspective version 3.2b writes Adobe Illustrator files and MacDraw PICT files. Also supports an image library and displays the length of the line. B. Knick Drafting, 313 Marlin Pl., Melbourne Beach, FL 32951, 305/727-8071. \$35; \$219 new.

MacRacquetball version 2.0 has simplified score bars and a Chooser to select mode of play; easier to modify player characteristics. AppleTalk compatible; works with more than 1MB of RAM. Goes to MiniFinder when you quit so you don't have to shut down. Practical Computer Applications, 1305 Jefferson Hwy., Champlin, MN 55136, 612/427-4789. \$5 for s/h; \$59.95 new.

MiniCad version 4.0 includes an expanded double-line creation tool; double-line polygons; L, T, and X joins; diagonal, angular, and chain dimensioning; easier arc and circle creation; expanded intersection and trim; reshape by length and angle; leader lines; and an ex-

panded "select" option. Runs 80 percent faster than MiniCad 3.0. Diehl Graphsoft Inc., 8370 Court Ave., #202, Ellicott City, MD 21043, 301/461-9488. \$35; \$495 new.

PageTutor/Advanced Features

module is the fourth module in an audio/disk-based training system for PageMaker; also incorporates tutorials for PageMaker 3.0. Covers text wrapping, creating style sheets, using and modifying templates, assigning spot colors, and printing in color. Personal Training Systems, P.O. Box 54240, San Jose, CA 95154, 408/559-8635. \$65 for upgrades on first three modules plus Advanced Features; \$10 to upgrade each separately; \$49.95 new.

Plains & Simple version 1.05 is compatible with the Mac II and MultiFinder. Deletes historical records from files saved to disks; repairs files that may have been damaged; uses a new shortcut to move more quickly through distribution accounts when entering journal transactions. Great Plains Software, 1701 S.W. 38th St., Fargo, ND 58103, 701/281-0550. Free for subscribers to support plan; \$50 for nonsubscribers; \$395 new.

PowerDraw version 2.0's new features include curve-smoothing by both B-splines and bezier curves, full tangent construction capability, and user-programmable macros and custom functions. Combines user-friendly draw interface and powerful CAD features. Engineered Software, P.O. Box 18344, Greensboro, NC 27419. \$90; \$795 new.

PowerPoint version 2.0 is MultiFinder and AppleShare compatible, allows access to 16.8 million colors, and adds templates providing built-in color schemes, background effects, and fonts. Includes

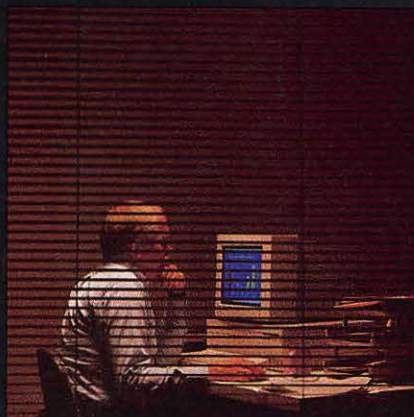
spell checker, find-and-replace command, and the ability to import graphics directly in encapsulated PostScript formats. Microsoft Corp., 16011 N.E. 36th Way, P.O. Box 97017, Redmond, WA 98073-9717, 206/882-8080. \$40; \$395 new.

PowerTools version 2.0 contains a new version of the FreeFlow analysis tool with improved ASCII Bridge function for file import/export and merge dictionary capability. Allows analysts to create leveled sets of data and control-flow diagrams. Iconix Software Engineering, Inc., 2800 28th St., #320, Santa Monica, CA 90405, 213/458-0092. Free to owners with maintenance agreements; \$4495 for complete set.

Pro-Cite includes 20 predefined workforms (journal, book, dissertation) allowing data to be searched, sorted, edited, indexed, and formatted into any bibliographic style. Personal Bibliographic Software, Inc., P.O. Box 4250, Ann Arbor, MI 49106, 313/996-1580. \$95 for registered owners of Professional Bibliographic System; \$395 new.

Professional Image version 2.0 (was Carousel Color Slide Software) displays 256 colors on the Mac II. Can create slides using the fill and pen patterns of MacDraw and output them directly to a LaserWriter printer. Through an arrangement with Stokes Slide Service (512/458-2201), MacDraw files can be sent via modem and returned as 35mm slides or overhead transparencies. (Slides cost \$7 for 2048-line resolution and \$14 for 4096.) Color and black-and-white on the Mac II, and black-and-white on the Mac SE and Plus. Thirty-day guar-

(continues)



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Updates

antee. 20/20 Data Systems, 7000 Cameron Rd., Austin, TX 78752, 512/454-2508. \$20; \$249 new.

QuickWord II is compatible with MultiFinder. Includes Sort, Print, and Save commands. Can be activated or deactivated using a command sequence. Enterset, 2380 Ellsworth St., Berkeley, CA 94704, 415/549-0539. \$20; \$59 new.

SimpleSpan version 2.5, **BackSpan** version 2.0 add printing and text report capabilities, adjustable joist spacing, and user-definable steel grades. Arch Software Inc., 1642 Pullan Ave., Cincinnati, OH 45223 513/681-1642. \$8 s/h for first update; \$39 for second update on double package; \$99 individual new; \$149 package.

Timbuktu version 2.0 allows multiple participants to observe or modify documents on one another's Macintoshes. Assures that a user's Mac cannot be accessed or operated by another user without permission. WOS Data Systems, Inc., 1321 Wakarusa Dr., #2010, Lawrence, KS 66044, 913/843-8101, 800/843-8101. Free; \$99.95 for one Mac; \$189.50 for two; \$495 for six.

TMON version 2.8.1 is useful for users with Mac IIs or other 68020-equipped Macs who can no longer use TMON 2.585. Includes several new debugging aids like TMON FKEY and StopINIT as well as a 110-page manual. ICOM Simulation, Inc., 648 S. Wheeling Rd., Wheeling, IL 60090, 312/520-4440. Free for upgrade from version 2.8; \$50 with s/h for upgrade from version 2.585; \$149.95 new.

True BASIC version 2.0 features full Mac II support. Modules include public or private routines, work spaces, and script files. True BASIC, Inc., 12 Commerce Ave.,

Airport Industrial Park, West Lebanon, NH 03784, 603/643-3882. \$35 plus \$15 run-time license; \$99.95 new.

Turbo Mouse and Turbo Mouse

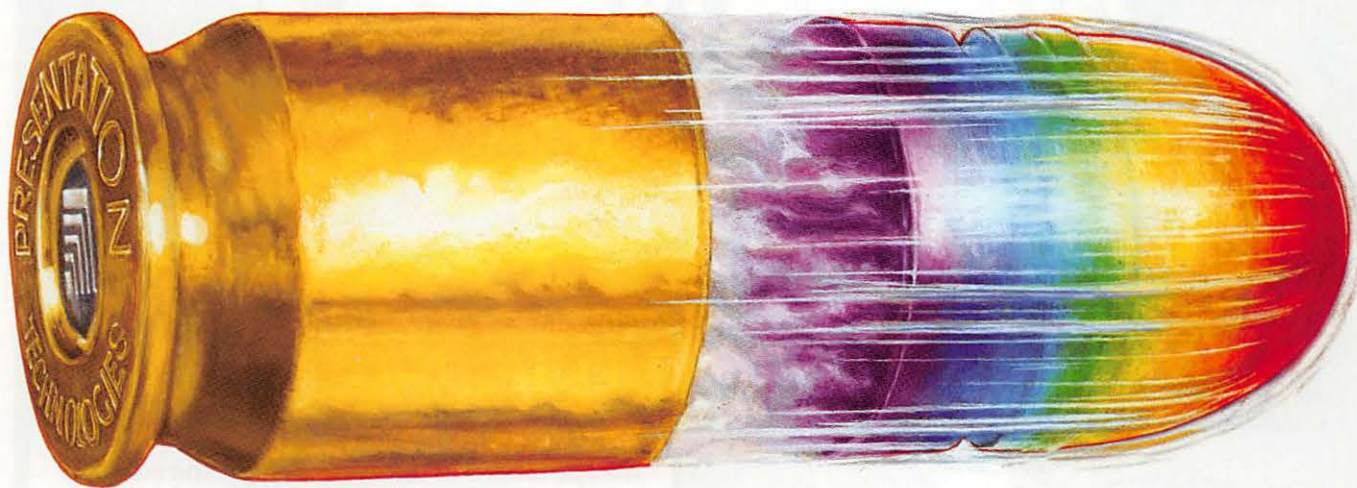
ADB increase precision by eliminating virtually all moving parts except the trackball bearings. Click-lock feature on button. Turbo Mouse ADB buttons can be programmed to perform one of seven functions including Open and Close. Kensington Microwave Ltd., 251 Park Avenue S, New York, NY 10010, 212/475-5200. \$60 trade-in; \$169.95 new.

VersaCAD/Macintosh Edition version 1.1 includes a "rubber band" group-stretch feature, a sophisticated chamfer capability that can be set at any angle, and encapsulated PostScript Format output to other applications. A Bill of Materials HyperCard module can create full reports in user-defined formats. VersaCAD Corp., 2124 Main St., Huntington Beach, CA 92648, 714/960-7720. Free; \$1995 new.

Word Finder version 2.0 lets users use Word Finder with HyperCard and MultiFinder. Microlytics, Inc., Techniplex, 300 Main St., East Rochester, NY 14445, 716/248-9150. Free plus 2.50 s/h if purchased after December 1, 1987; otherwise \$15 plus 2.50 s/h; \$59.95 new. □

To have products listed in this section, send upgraded software, an outline of major changes since the previous release, upgrade price, suggested retail price, company name, mailing address, and phone number to Updates, Macworld, 501 Second St., San Francisco, CA 94107.

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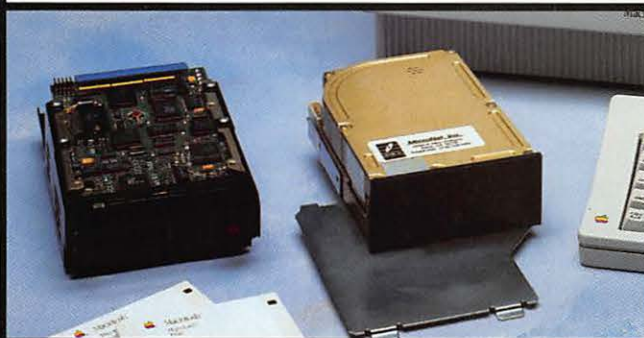


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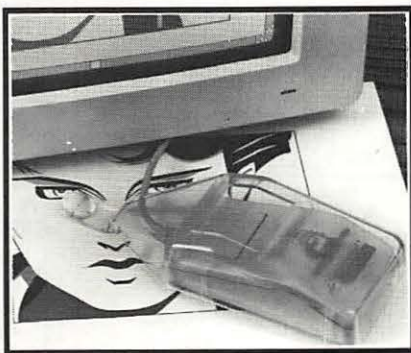
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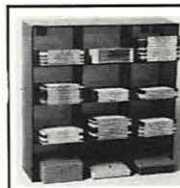
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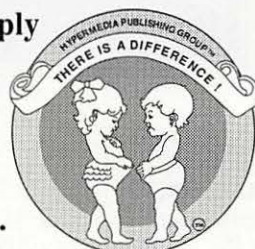
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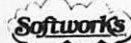
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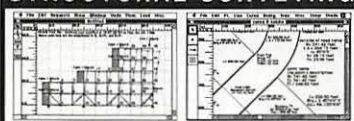
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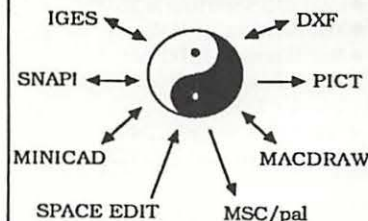
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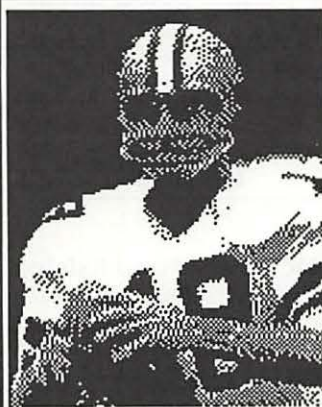
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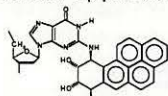
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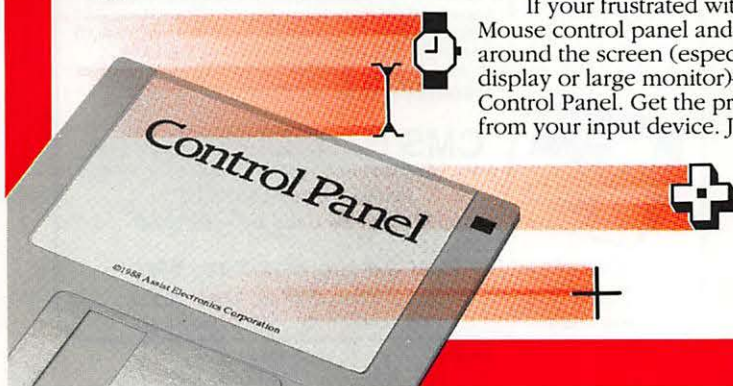
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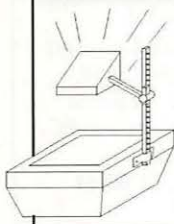
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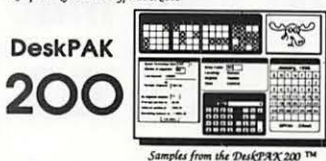
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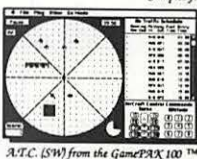
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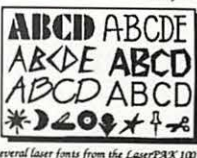


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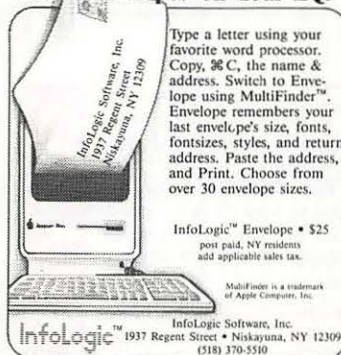
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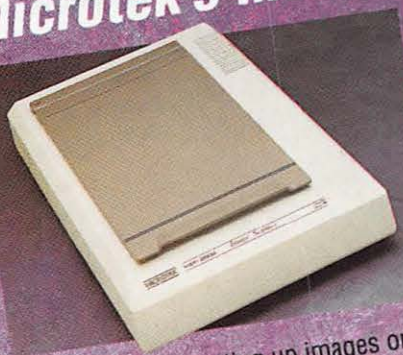
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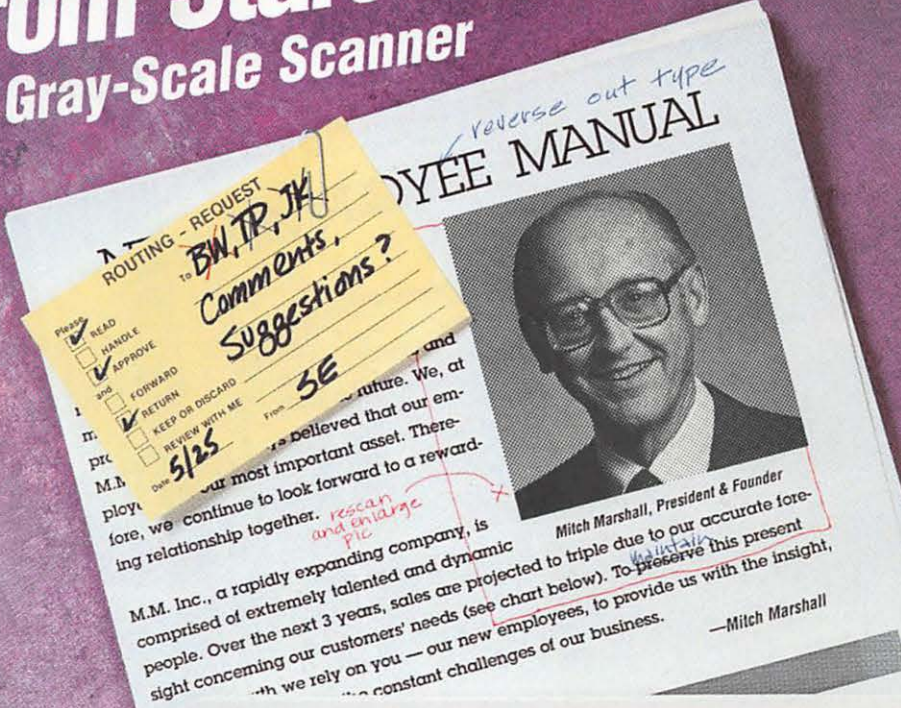


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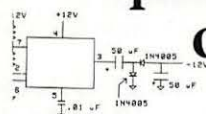
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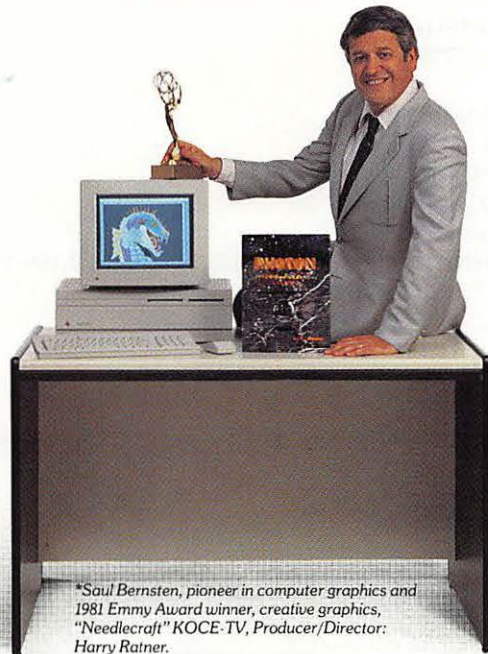
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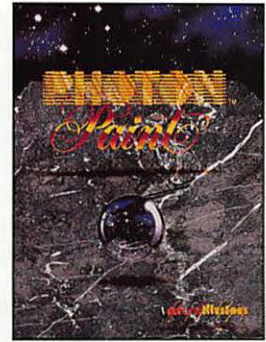
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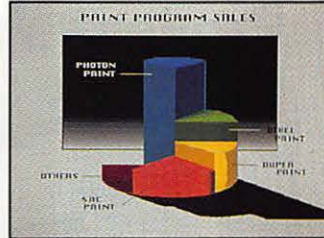


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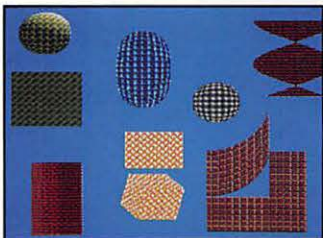
Design graphs and charts



Produce illustrations



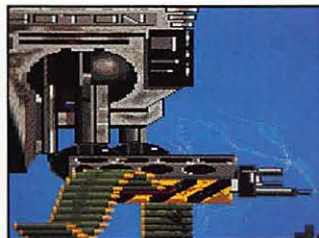
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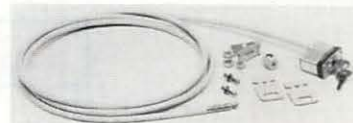
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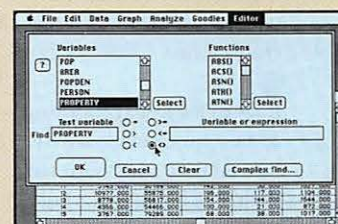
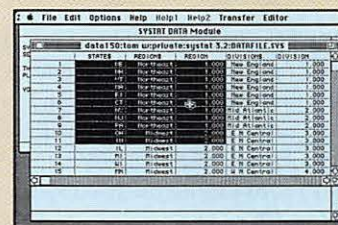
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Statistics Basic statistics, frequencies, t-tests, post-hoc tests Multiway crosstabs with log-linear modeling, association coefficients, PRE statistics, asymptotic standard errors Nonparametric statistics (sign, Runs, Wilcoxon, Kruskal-Wallis, Friedman two-way ANOVA, Mann-Whitney U, Kolmogorov-Smirnov, Lilliefors, Kendall coefficient of concordance) Pairwise/listwise missing value correlation, SSCP, covariance, Spearman, Gamma, Kendall Tau, Euclidean distances Linear, polynomial, multiple, stepwise, weighted regression with extended diagnostics Multivariate general linear model includes multi-way ANOVA, ANOCOVA, MANOVA, repeated measures, canonical correlation Principal components, rotations, components scores Multidimensional scaling Multiple and canonical discriminant analysis, Bayesian classification Cluster analysis (hierarchical, single, average, complete, median, centroid linkage, k-means, cases, variables) Time series (smoothers, seasonal and nonseasonal ARIMA, ACF, PACF, CCF, transformations, Fourier analysis) Nonlinear estimation (nonlinear regression, maximum likelihood estimation, and more).

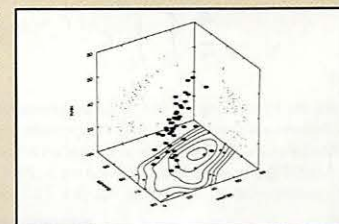
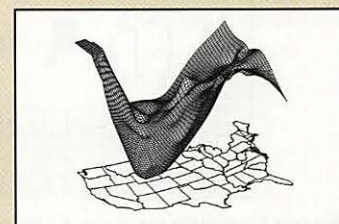
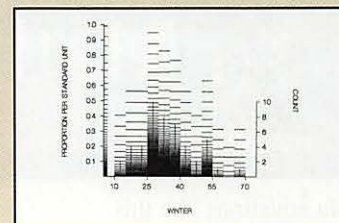
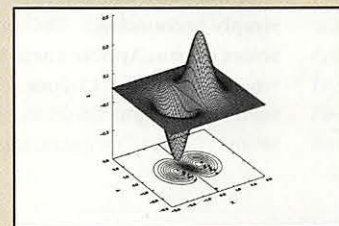
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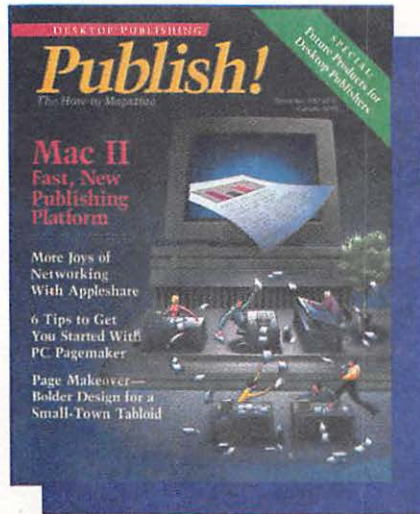
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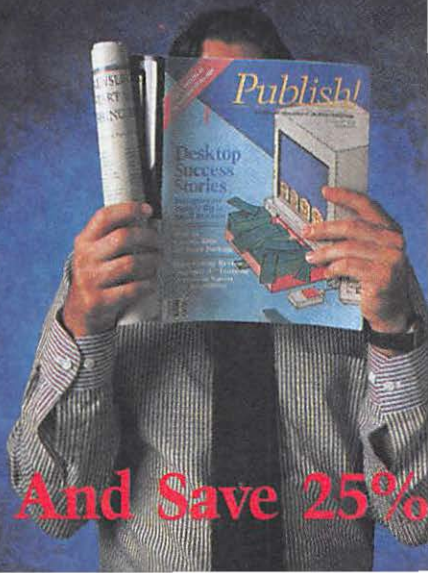
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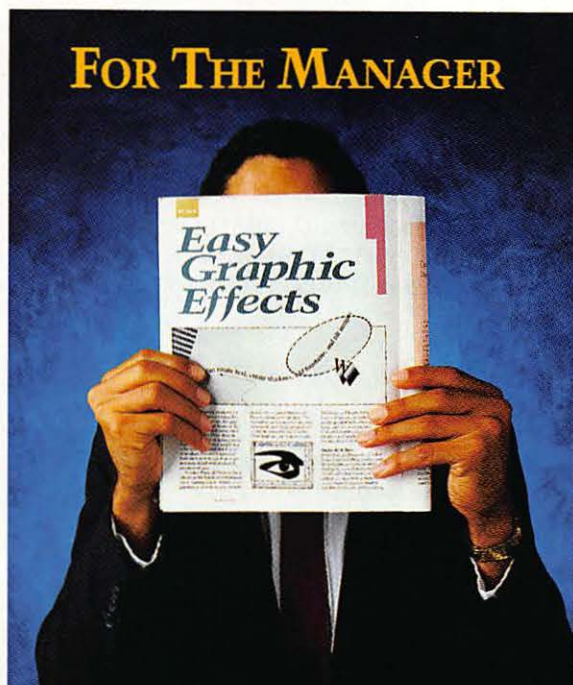
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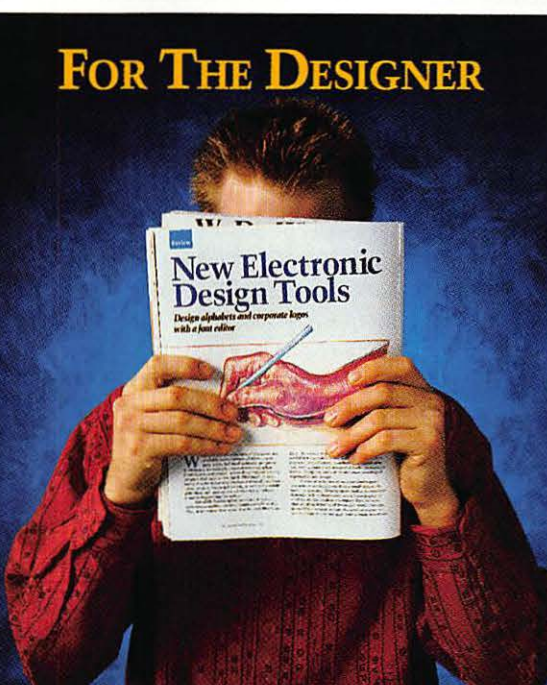
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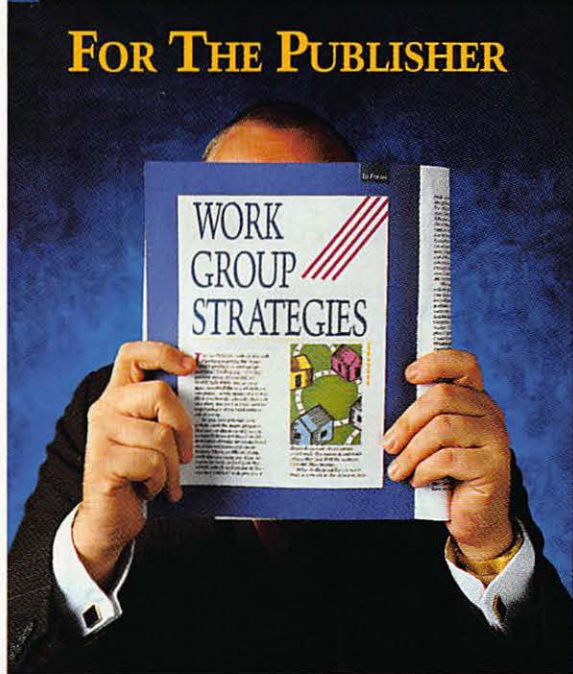
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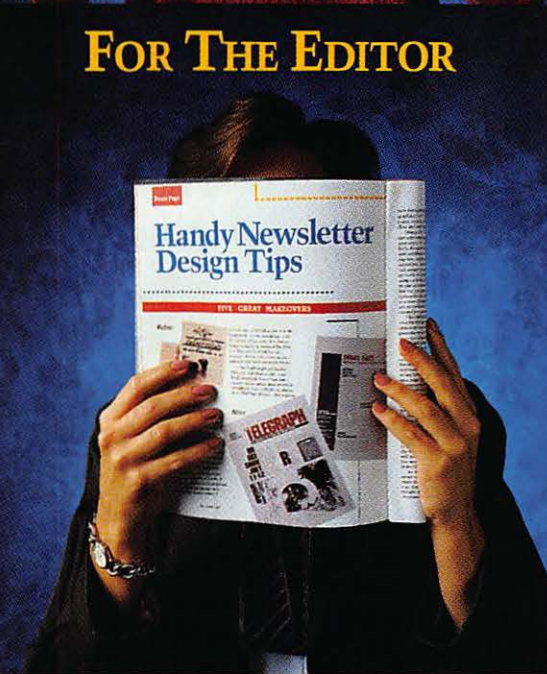
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And MACWORLD Expo has grown right along with the Macintosh market. We went from 208 booths at MACWORLD Expo/San Francisco in 1985 to over 1,200 in 1988. While our Boston show has been every bit as successful. In all, more than 250,000 hot prospects have come to MACWORLD/Expo to see, touch, try, and buy thousands of Macintosh products. In fact, the Macintosh market has

expanded so quickly, we've added a third MACWORLD Expo to meet the demand. **Announcing MACWORLD EXPO/Washington.**

This is your opportunity to reach a tremendously important Macintosh market—the federal government.

In 1987, Uncle Sam's budget for information technology was around \$13.5 billion. And according to *Federal Computer Week*, it's headed toward \$20.2 billion by 1991.

The federal government is one of the largest users of Macintosh hardware and software—communications, accounting, education, engineering, office automation, CAD/CAM, database management, and more.

So there's plenty of opportunity for those in the right place at the right time—April 26, 27 & 28, 1989. **The original Macintosh computer show.**

MACWORLD Expo/Washington is your chance to expand your reach beyond MACWORLD Expo/Boston and MACWORLD Expo/San Francisco. And sell directly

to thousands of key decision-makers in the federal government.

MACWORLD Exposition is sponsored by *MACWORLD*, the Macintosh magazine, and *Federal Computer Week*, the newspaper for systems decision makers in government.

For information about exhibiting in Washington, Boston, or San Francisco in 1989, return the attached coupon today. After all, you don't want to miss out on this monumental opportunity.

MACWORLD EXPOSITION®

This is your chance to appear before
the federal government.

If you'd like more information about exhibiting at MACWORLD Expo 1989, please fill out and mail this coupon to: MACWORLD Expo, P.O. Box 155, Westwood, MA 02090.

I'm interested in exhibiting at MACWORLD Expo 1989 in:

☐ San Francisco ☐ Washington, D.C. ☐ Boston
January 20, 21 & 22, 1989 April 26, 27 & 28, 1989 August 10, 11 & 12, 1989

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Why this publication and more than 1,400 others let us go over their books

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“What’s wrong with copying software?”

“I use a lot of programs on my personal computer, and I copy them all the time.”

“I’m a programmer. Every time you copy one of my programs, you’re taking away my income—I depend on sold programs for a living.”

“Oh, come on. I bought it: I have a right to copy it.”

“**You do have a right to make a back-up, that’s true. But when you start copying programs for your friends and co-workers, that’s breaking the law.**”

“What law? Any copying I do is in the privacy of my own home.”

“**It doesn’t make any difference where you do it. Every time you copy a program without permission from the publisher, you’re committing a federal offense.**”

“That’s all right, I won’t get caught.”

“**You’re missing the point. The issue isn’t “What can I get away with?”—it’s “who am I hurting?”**”


Remember, lots of people worked hard to produce every program you use: designers, programmers, distributors, retailers, not to mention all the people who support users. They have a *right* to be compensated for their efforts, and their major compensation is through software sales.”

“Well, I don’t mean to hurt all those people—or anyone, really.”

“**Unfortunately, that’s what copying does: it hurts people. And, ultimately, it hurts people like you, who want new and innovative software.**”

**Do you copy software?
Think about it.**

The unauthorized copying of software is a crime.

SPA  Software Publishers Association
Suite 1200
1111 19th Street, N.W.
Washington, D.C. 20036

Macworld Best-Sellers

Months on chart

Last month

This month

Business Software

19	1	1	Microsoft Works <i>Microsoft</i>
39	2	2	Microsoft Word <i>Microsoft</i>
27	4	3	PageMaker <i>Aldus</i>
31	3	4	Microsoft Excel <i>Microsoft</i>
32	6	5	MacDraw <i>Claris</i>
17	5	6	MacWrite <i>Claris</i>
17	10	7	SuperPaint <i>Silicon Beach Software</i>
1	—	8	WordPerfect for the Macintosh <i>WordPerfect</i>
2	—	9	dBase Mac <i>Ashton-Tate</i>
15	—	10	MacPaint <i>Claris</i>

Education Software

23	1	1	Math Blaster <i>Davidson & Associates</i>
7	2	2	Reader Rabbit <i>The Learning Company</i>
19	4	3	Typing Tutor IV <i>Simon & Schuster Computer Software</i>
1	—	4	MacKids Preschool Disk 1 <i>Nordic Software</i>
4	—	5	Typing Made Easy <i>QED Information Sciences</i>

Entertainment Software

23	3	1	MacGolf <i>Practical Computer Applications</i>
23	2	2	Flight Simulator <i>Microsoft</i>
19	1	3	Dark Castle <i>Silicon Beach Software</i>
3	4	4	Beyond Dark Castle <i>Silicon Beach Software</i>
5	5	5	Falcon <i>Spectrum HoloByte</i>

Networking/Data Communications

19	1	1	TOPS <i>TOPS</i>
23	3	2	LocalTalk (formerly AppleTalk) <i>Apple Computer</i>
15	2	3	AppleShare <i>Apple Computer</i>
10	4	4	PhoneNet <i>Farallon Computing</i>
1	—	5	Red Ryder <i>FreeSoft</i>

Months on chart

Last month

This month

Hard Disks*

19	2	1	Apple Hard Disk 20/20SC <i>Apple Computer</i>
12	4	2	Rodime 20 Plus <i>Rodime</i>
4	—	3	MacStack 20 <i>CMS Enhancements</i>
1	—	4	Pro Series 20-SE <i>CMS Enhancements</i>
9	—	5	FX-20 <i>General Computer</i>

Add-in Boards

10	4	1	Radius Accelerator <i>Radius</i>
10	3	2	Apple 1MB Memory Expansion Kit <i>Apple Computer</i>
10	2	3	Apple 2MB Memory Expansion Kit <i>Apple Computer</i>
1	—	4	MacSnap 524 <i>Dove Computer</i>
1	—	5	MacSnap 548 <i>Dove Computer</i>

Product Watch

Editors' choice: Other recent or forthcoming products of particular interest.

Mac Architrion *Gimeor* 3-D CAD software

Montage FR1 *Presentation Technology* film recorder

Swivel *Paracomp* 3-D modeling program

Source: Exclusive InfoCorp survey of more than 125 Macintosh retailers and selected mail-order suppliers. Covers sales during May 1988.

*Does not include hard disks installed at the factory.

The WriteNow difference: *Ease, Performance, and...*



	WriteNow 2.0	MacWrite 5.0	MS Write	MS Word 3.01
Spelling checker size	100,000 words	100,000 words	80,000 words	80,000 words
Font size range	4-127 pts.	7-24 pts.	7-72 pts.	2-127 pts.
Maximum recommended document size (in pages)	Over 2,000	240	50	500
Number of open documents	Unlimited *	1	30	30
Mail merge	Yes	No	No	Yes
Number of editable, on-screen columns (WYSIWYG)	4	1	1	1
On-screen auto-numbering footnotes	Yes	No	No	No
Automatic repagination	Yes	Yes	No	No
Graphics in same line as text	Yes	No	Yes	Yes
Multiple headers and footers	Yes	No	No	Yes
Extensive Undo	Yes	No	No	No
Variable line spacing (in points)	Yes	No	No	Yes
Selective font, size, style, and ruler changes	Yes	No	No	Yes
MacUser Magazine's Best New Word Processor	Yes	No	No	No
Search for a word	2.4 sec	7.6 sec	9.5 sec	9.7 sec
Spell Check document	6.3 sec	2 min 34.0 sec	2 min 2.3 sec	1 min 48.0 sec
Copy & Paste large area	6.8 sec	1 min 0.9 sec	12.4 sec	12.3 sec
Change font size of document	10.7 sec	50.2 sec	17.6 sec	16.2 sec
Change font of document	10.8 sec	37.1 sec	14.1 sec	15.2 sec
'Save As' a 12-page document	3.6 sec	9.4 sec	20.3 sec	19.6 sec
Retail Price	\$195	\$125	\$175	\$395
Happy Users	Yes	?	?	?



...Happy Users!

Our users love WriteNow—a claim our competition can't easily make for their products.

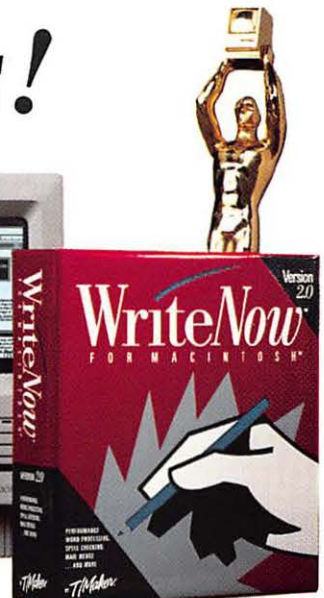
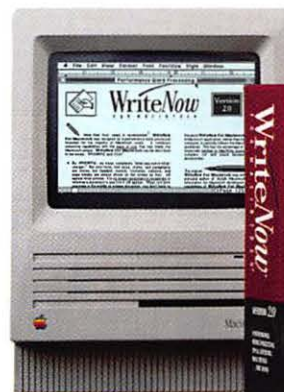
How do we know? Because our users tell us—on registration cards, on the telephone, on bulletin boards, and in letters.

We've heard dramatic stories about how WriteNow has significantly reduced training and support costs. And how clean, fast, and enjoyable it is to use. And how WriteNow got the job done when our competition sputtered.

You see, at T/Maker we feel a great word processor is more than just a stockpile of features. It's the *usability* of those features—how easy they are to learn and use, and how they *feel* under your fingertips when doing real work.

And from their overwhelmingly terrific response, it's clear our users agree.

WriteNow 2.0 is the user's choice for best Macintosh word processor—and we'll show anyone our customer registration cards to prove it!



T/Maker.

What's new with WriteNow 2.0?

Mail merge, 100,000-word dictionary, Cursor key support, Direct import/export of Text, MacWrite, and RTF (Word, Write, and Works option) files, Window menu, Decimal tabs, Hide pictures option, MultiFinder and network compatibility, ...and more!

Registered users will receive upgrade details in the mail. Non-registered users should call or write for details.

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All timing tests performed by an independent testing organization on a 12-page document using a Macintosh SE and a 20 megabyte hard disk.

* Number determined by Macintosh system constraints.

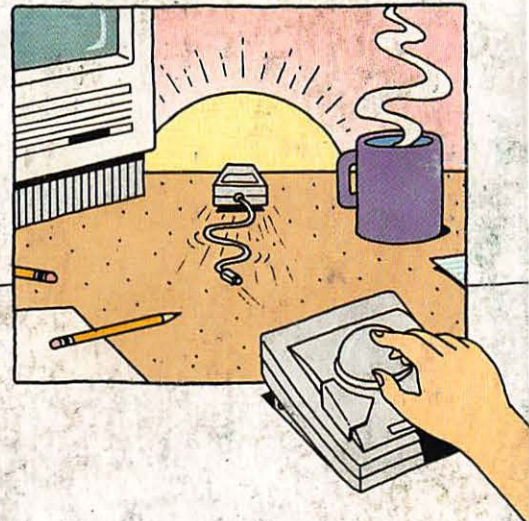
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Demo version of WriteNow included on all Jasmine hard drives.



Circle 332 on reader service card

10 reasons why you should switch to New Turbo Mouse.



1 Fly across even the biggest screen with automatic acceleration. Turbo Mouse® senses the speed at which you're working and moves the cursor further when you move faster.

2 No rolling room required. With the Turbo mouse ball on top, you move only the ball, not the whole mouse.

3 Three times as precise as a mouse. New patented "optical levering" technology offers 200 CPI pin-point precision.

4 One button is for regular clicking, the other is a click lock. You choose which is which.

5 Advanced two-button design allows for either right or left-handed use!

6 Only 4" by 6", Turbo Mouse fits neatly beside any Macintosh® or Apple IIGs® keyboard.

7 Turbo Mouse offers a second mouse port. Turbo Mouse ADB offers a second ADB port.

8 Perform one of seven functions—Save, Print, Open, Close, New, Quit, or Undo when you click both buttons at once. (Only in Turbo Mouse ADB.)

9 Turbo Mouse ADB, #62360, works with Mac SE, Mac II, or Apple IIGs. Turbo Mouse, #62358, works with Mac or Mac Plus. Both have a suggested retail of \$169.95.

10 It's easy to find. For a Turbo Mouse dealer near you, just call **1-800-535-4242**, or **212-475-5200**.

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